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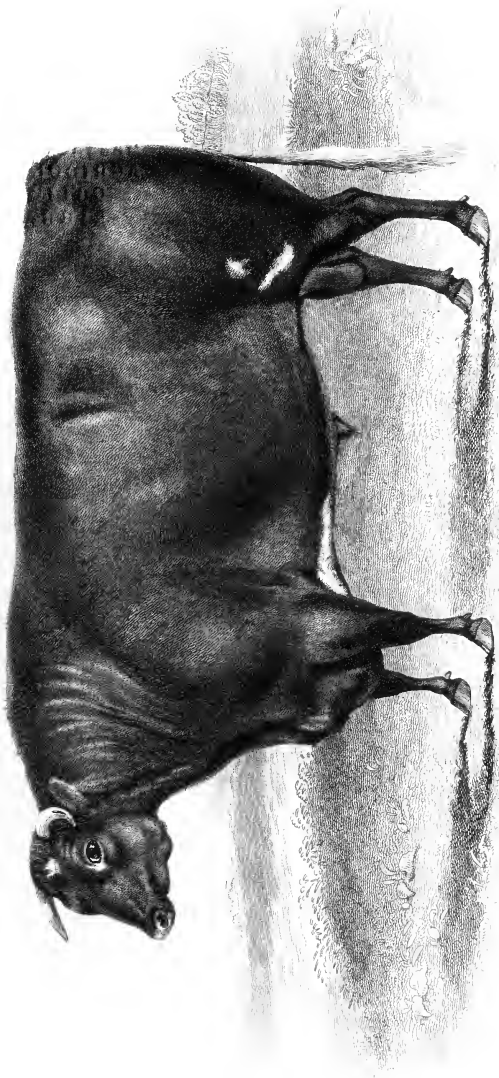












# THE FARMER'S MAGAZINE.

VOLUME THE THIRD.

(THIRD SERIES.)

JANUARY TO JUNE, DCCCLIII.

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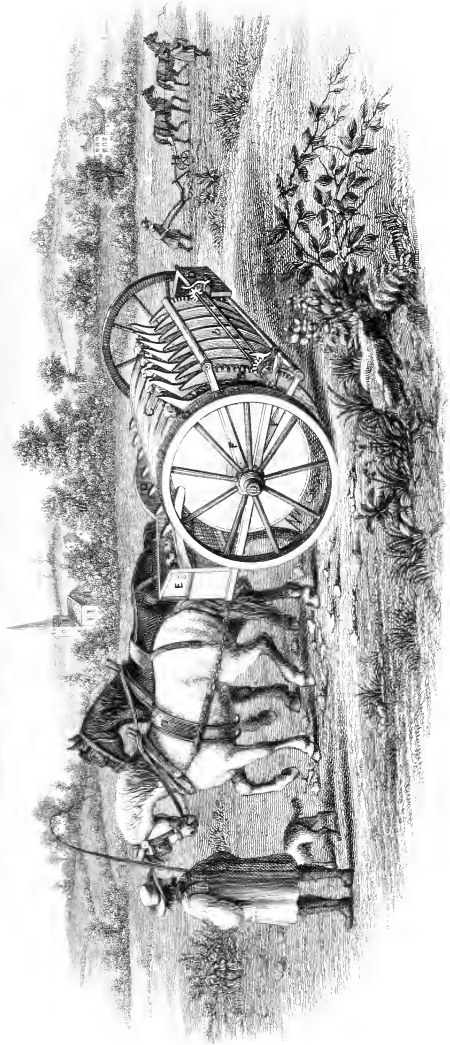
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# THE FARMER'S MAGAZINE.

JANUARY, 1853.

## PLATE I.

### A SHORT-HORNED BULL.

Phoenix (10608) calved March 28, 1848, bred by and the property of Mr. Thomas Crisp, of Hawk Hill, Alnwick, got by Ronald (8507), dam (Duchess) by Guy Faux (7062), g. d. (Young Red Duchess) by The Peer (5455), gr. g. d. (Red Duchess) by Bachelor (1666), — Duchess) by Wellington (683), — (Bright Eyes) by Admiral (4), — by Sir Harry (1444), — by Mr. R. Colling's Colonel (152), — by a grandson of Hubback (319), — by a son of Hubback (319), has won the following premiums:—

1849. As a yearling, first prize at Border Union Agricultural Society.

1851. For best old bull, first prize at Border Union Agricultural Society.

„ Ditto, ditto, at Northumberland Agricultural Society; likewise Silver Cup with Five Sovereigns added, for best of all prize bulls exhibited at the above meeting, held at Newcastle-on-Tyne.

1852. For best old bull, first prize at the Royal Agricultural Society of England's meeting at Lewes.

„ For best old bull, first prize at Highland and Agricultural Society of Scotland's meeting at Perth; likewise Sweepstakes at the above meeting, open to all ages, including winners of premiums in former years, and Silver Medal to breeder.

„ For best old bull, first prize at the Royal Irish Agricultural Society's meeting at Galway, and Silver Medal for best short-horn bull of any age exhibited, likewise Gold Medal for best prize bull of any breed or age; and Silver Medal for breeder of the above.

## PLATE II.

### A PATENT MACHINE FOR PICKING UP STONES;

INVENTED BY MR. J. T. FOSTER, OF NEW YORK.

This important machine was recently invented and patented by Mr. J. T. Foster, of New York, who is well known to the agricultural interest of the United States for several of his previous inventions. The great utility of such an implement as herein represented will be readily appreciated by every farmer, and will open a new era in agriculture. It is calculated to clear of stones from 7 to 10 acres of land per day, with the aid of a good team of horses; making a saving of at least 200 per cent. over hand labour, and does the work effectually, leaving no stone in its track, and completely harrowing the ground.

To describe the machine more fully, we refer to the steel engraving annexed. Letter C represents a cylinder containing four rows of teeth, or lifters; this cylinder is secured to the axle, and is made to revolve by the friction of the wheel G, which is also secured to the axle, the other wheel running independently to accommodate itself in turning. B represents the rake, held in its place and supported by the arms F F, through which the axle passes; by such means the rake hangs on the

centre of its own circle, which is considerably greater than the cylinder to admit a stone of the size of a peck measure to pass between, and is capable of being adjusted by the crank and shaft seen just behind the rake, not indicated by letter, and held in its required position by the dogs or palls A A. It will now be perceived that as the machine moves forward the rake collects everything that is not capable of passing between the teeth, which are but three inches apart; and at the distance of every four feet the rake is relieved of what it has accumulated by the revolving lifters, which convey them into the hopper, E, which is on a sufficient angle to allow them to roll into the box, D D. When the box has accumulated a load, the driver, by turning the crank, raises the rake to a height to clear any obstacle that might be in the way, locks it, drives off, and dumps as with an ordinary cart, and is ready to repeat the operation by simply dropping the rake.

A machine to pick up stones we have ever considered among the last of inventions, but now we have a simple, efficient, labour-saving implement. This machine is well adapted for harvesting potatoes: and while doing this, as well as picking stones, cultivates the land. We deem this invention of great importance to the farming interest, and one of those that will afford the facilities to practical agriculture that are requisite to place farmers on a footing with those in other arts of life. Every considerable improvement in the labour of the farm has an important bearing in national prosperity and the general interest of humanity.

## THE FARM LABOURER.

### HIS ACCOMMODATION AND TREATMENT IN HEALTH AND UNDER DISEASE.

BY JOHN DONALDSON,

Late Professor of Agriculture and Botany, at Hoddesdon, Herts, and author of Prize Essay on the Cultivation and Management of Underwood, awarded by the Royal Agricultural Society of England.

The best arranged social systems that have yet been enacted in the world assign a very large portion of the human race to the performance of labour, in order to obtain a remuneration wherewith to live and procure the necessaries of life. In civilized communities, labour is the most valuable of all possessions, and the exertions of it produce all the elegancies of life, and render the existence of mankind comfortable and happy. Labour is the real measure of the exchangeable value of all commodities: money the nominal price only. Like other commodities, it has both a real and a nominal price. The real price is the quantity of the necessaries and conveniences of life which are given for it; the nominal price is the quantity of money. The labourer is rich or poor, is well or ill rewarded, in proportion to the real, but not to the nominal price of his labour.

The rent of land and the profits of stock are measured by labour, and the component parts of price are included in the quantity of labour which they can each of them purchase or command. In every society the price of each commodity resolves itself into one or all of the three parts—labour, rent, and profit; and in every improved society all the three enter, more or less, into the price of the far greater part of commodities. There are some cases where the price of a few commodities resolves itself into the two parts of the wages of labour and the profits of stock, and a smaller number consists wholly in the wages of labour.

The produce of labour forms the natural recom-

pense or wages of labour. In that original state of things, which precedes the appropriation of land and the accumulation of stock, the whole produce of labour belongs to the labourer, as he has no master or landlord to share with him. But this original state of things could not last beyond the first introduction of the appropriation of land and the accumulation of stock. As soon as land becomes private property, the landlord demands a share of all the produce which the labourer can either raise or collect from it. The rent is the first deduction from the produce of the land; and the second is the profit that accrues from the produce of the labour that has been so employed. The produce of every kind of labour, in any art or manufacture, is liable to the like deduction of profit. The common wages of labour depend every where upon the contract that is made between the two parties to whom belong the profits of stock and the wages of labour, but the interests of these parties are by no means the same. The workmen desire to get as much, and the masters to give as little, as possible. The former are disposed to combine in order to raise, the latter in order to lower, the wages of labour. The masters commonly succeed; for, being fewer in number, they can more easily combine: and the law does not prohibit their combinations as it does those of the workmen. In all disputes the masters generally have the advantage, and reduce the wages to the lowest point. Wages should be sufficient to maintain the labourer, and somewhat more, or it will be impossible for him to



bring up a family. The demand for labourers increases with the additions to the revenue and stock of every country, which is the increase of national wealth. The augmentation of wealth, and not the overflowing abundance of it, causes the highest rate of wages; and the increase of population has a most decisive effect. The liberal reward of labour is the necessary consequence and the natural symptom of increasing wealth. The scanty maintenance of the labouring poor is the plainest proof that things are at a stand, and the starving condition that they are going fast backwards. The liberal reward of labour, as it is the effect of increasing wealth, is also the cause of increasing population.

Various causes combine to fix the price of labour; and it is not a little remarkable, that unproductive labours are the best paid. By unproductive labour, is meant that which adds no value to the materials on which the work is performed. The employment of the higher orders in society is unproductive of any value, as it does not fix itself on any vendible commodity, or permanent object, which endures after the labour is past, and for which an equal quantity of labour can be afterwards procured. The declamations of the actor, the harangues of the orator, and the tunes of the musician all perish in the very instant of their production. Yet, notwithstanding this very evident fact, unproductive labour is ever the best remunerated, as the performances require more expense and greater exertion in acquiring the necessary parts of the art. Coarse and vulgar practices which admit of an easy performance, and which are accessible to a greater number of performers, are valued at a much lower rate than others which require a greater quantity both of value and labour in acquiring the aptitude of execution. Grossness and refinement find in this case, as in most others, the remuneration for the expenditure of labour and its value. The coarser materials form the pedestal of society, and the value increases upwards till the top ceases to perform any necessary function, owing to the elevation being supported by the joint-efforts of the nether contributions.

The position of the farm labourer ranks him among the worst paid of the labouring classes, as his employment is menial and coarse, and requires very little or no preparation for its performance. The exertions are of the rudest kind, and are accessible to the most untutored human being that is at all capable of observation and imitation. And though a superior skillfulness can be shown in that art as well as in all others, yet it fails to attract much notice, or to elevate the performance to any superior remuneration. The number of persons who are capable of acting the labourer, and the want of the means that are necessary to advance to

a higher station, have fixed and kept the wages of agricultural labourers at the very lowest amount that is capable of supporting a living frame of useful action. This position in the social system entitles the objects of it to the kindly feeling and benevolence of the class that employs them, and to whose benefit the current of circumstances directs a large share of the produce of labour. This extension and application of the better feelings of human nature is very loudly and most imperiously called for, in order to rectify in some measure the defects of the social system in not giving to every fellow-creature a competent share of the essential necessities of life. It is the serious blunder of all systems that have yet existed; but it seems to be the fate of mankind, throughout every variety and degree of error, ere they arrive at the happy termination by finding the right path. No super-structure can stand steadily without a safe and durable foundation: it must be wide and comprehensive, or the top may overbalance it; the structure must bear equally on the underparts, or too much pressure on one place may crush and destroy some of the supports, that will disconnect and break the combination of the whole edifice. The want of this most valuable and essential consideration has produced every revolution and rebellion that has happened on the face of the earth; want induces discontent, and being fed by other evils, proceeds to canvass the propriety of the immeasurable distance between the bottom and the top of the social fabric, and to enquire if a nearer approach could not be made with mutual advantage.

Having said thus much we will now consider the size of the farm and the form of building to be occupied by the labourer. The size of farms that are most proper for the active and useful development of capital may vary from 200 to 500 acres. The first extent could not be lowered without cramping the energies and restricting exertion; and the last amount of acres could not be exceeded without too much increasing the individual possession, and preventing the employment of a moderate amount of capital. The intervening numbers between 200 and 500 may afford the suitable employments for the varying sums of money in the hands of individuals. It is however necessary that the labourers live upon the farm, and that they be located at an easy distance from the farmery; the dwellings must be erected at the expense of the landowner, as they are a permanent property in which the farmer has only a usufructuary interest; the site of the dwellings may be so chosen as not to interfere with the shape of a field—a common or a cut off space of ground which projects from or abuts upon any field or plantation that has been laid out and settled. The required number of

single dwellings may be formed in a square with an open south front, or in the form of a circle or a polygon. If the ground be naturally dry, the first floor may be on a level with the earth; but if the soil be clayey and wet, the floor must be raised one foot at least, and the space filled with broken stones. This precaution will secure a dry flooring, which is very desirable, and highly conducive to health. The base of the excavation must have an inclination to one corner to discharge into a drain the oozeings of the wet soil, which might form a body of water, and throw upwards a cold dampness that would prove injurious to inmates. All wetness must be removed from dwellings; the broken stones must be rammed hard into their position, and then covered with dross or very small gravel, on which the flooring of bricks is laid; one stone step will be required outside the door to reach the floor. All cottages must have two apartments on the ground floor, of about 20 feet by 15, and a stair in the centre that leads to the upper accommodation. The kitchen must be provided with a fixed iron fuel grate, a boiler and a small oven at the sides; the better apartment may have only a common fixed grate, but the windows must be made to open in warm weather; and the walls are to be well plastered.

The very first step in the improvement of human dwellings is to separate the sitting from the sleeping apartments. When a family is huddled together in a single apartment, where they sit, mess, and sleep, the decencies of life cannot be preserved, and a vitiation of character is insensibly produced. Neither can propriety be observed where cooking is done in the sitting apartment; an unavoidable degree of filthiness occurs in cooking, which is disagreeable to the person who sits by and looks on. Every dwelling, therefore, should consist of two rooms on the ground floor; one for common purposes, and the other for sitting and taking the meals. On the second floor there must be at least three sleeping apartments, formed partly in the roof by means of a height of one story and a-half of building. These apartments are floored with boards, and surrounded with lath and plaster. The window may be in the roof. Light bedsteads might be fixed here, belonging to the house. Four apartments might be occasionally formed, to accommodate families of a greater number of individuals. A small room for a dairy may be formed below stairs, and a door should open backward into the garden. This latter appendage is indispensable, for the purpose of growing vegetables, which are the most wholesome and essential of all human food. The width of the garden must be the length of the house, and extend so far backwards as to form a space of 600 square yards at

least, divided into the number of separate possessions by a thin fence of hedge or boards. In a corner of the garden, and covered by some low trees or tall shrubs, the privy may be placed, with a box receiving the excrements, which can be pulled backwards, lifted up, and emptied occasionally, and the contents mixed in compost. A few fruit-bearing bushes will subdivide the garden.

Behind the house, at the distance of fifteen feet, there may be placed a range of low buildings, forming the back premises, for the purpose of concealing the necessary utensils, which never should be seen or exposed to view. The back wall may be the highest, and form a lean-to; and the houses may include a washing apartment—a fuel-house and a lumber-room. The wash-house must have a boiling-vat and a fire-place. These back premises are most essential to any comfortable dwelling. The ashes may be very beneficially mixed with the contents of the privy or with earth.

In the congregated form of the buildings which we have now recommended there will be an open space in the centre, where a pump must be sunk for the common use of all the habitations; and a large oven or a bakery should also be raised for the general use. A longitudinal range of low buildings must be built for pig-sties, the back wall carrying the lean-to roof, and the front wall forming the low front of the shed for the pig. Each dwelling must have a single accommodation for fattening two pigs yearly with the potatoes and other vegetables. We mention this accommodation as a most essential part of the labourers' real wants.

The eaves of the roofs of the houses must be provided with spouts, to catch the rain water and convey it to casks fixed at proper places, to give it out as soft water for washing purposes. Water of this kind is a very useful possession in localities where the spring water is impregnated with minerals, which is often the case. The intercepting of the water from the roofs prevents it from falling on the ground and wetting and damping the front area of the dwellings. Though water be an essential element in every kind of life, yet dampness is very hurtful in its presence, and should be most carefully removed.

We have ever very strongly advocated that the farm labourer have a cow kept, as a part of his wages; and in order to secure to him a constant supply of milk throughout the year, we further advance an opinion that the cow belong to the farmer; and that when one goes dry before the time of calving, another be given for the use of the labourer which is in the full flow of milk. Of all the varied productions which the habitable globe affords, and whose use is known to man, none can be compared with the milk of the cow for the use

of a young family, and the products of it in the shape of butter and cheese. The value of it is reckoned 4s. or 5s. weekly, according to the price of the articles in the locality. We also recommend that a quantity of potatoes be planted in the field for the labourer, along with the crop of the farmer, in a quantity not less than 1,000 yards of drilled length; this allowance to be valued as a part of his wages, as the use of the cow is accounted for. This potato ground will yield roots for the use of the family, and for feeding two pigs yearly; and also food for ducks and hens which it may be convenient to keep. The garden will afford the early potatoes till the field growth come into use, and also the smaller culinary vegetables in their season. In Scotland and the north of England the farm labourers are paid nearly the whole amount of their wages in kind, and very beneficially; but whatever part of his wages he may receive in produce, we recommend the use of a cow and a quantity of potato ground as the most essential values that can be given him. The paying of wages in the produce of the farm saves the farmer the labour and expense of converting it into money, and it saves the labourer the trouble of finding the articles to be bought with the money he has got from the farmer, and which are often difficult to obtain. When he gets them from the farm, the value is enhanced by the ease with which they are got. The money wages should be paid weekly, and on the Friday evening, which gives the Saturday to lay out the necessary items for the succeeding week's provision. Where the sum of money is small, on account of a large part of the wages being paid in kind, the payments in cash may be monthly, quarterly or half-yearly.

The amount of the yearly wages of the labourer should be the highest that the social circumstances of the country can afford, and assisted by every indulgence which an active and willing benevolence can suggest and bestow. Employers have ever committed a very fatal mistake in depressing wages, and grinding down to the very lowest ebb the allowance of support to their fellow-creatures. A willing mind is ever a fruitful one, and will perform any action that is within the reach of possibility. On the other hand, harshness and ill-usage alienate every affection, and render the services of labour to be the mere efforts of compulsion, devoid of any care or interest in the result of the object. Every agent of performance should have an interest in the productive return of the labour.

The hours of labour should not be too many. In summer the commencement of work may be at 7 A.M. and continue till noon, and begin again at 2 P.M. and stop at 6 in the evening. Nine hours are quite sufficient for the performance of the due

amount of labour, when the horses and the labourers are all in the proper condition and temper: an hour less might even suffice. A long number of dreary hours tires the spirits, exhausts the energies, and keeps a quantity of work too long in hand. Quickness and dispatch are great and invaluable requisites in every business.

During winter, or from the beginning of November to the middle of March, the commencement of labour may be with the broad appearance of daylight, and end with the beginning of darkness; allowing one half-hour at noon, in which to give the horses a feed of oats, and the labourers to take luncheon. Short intervals between refreshments are beneficial both to man and beast. During rainy and stormy weather in severe climates all out-door work must be suspended, and confined to in-door operations. It is inhuman to expose men and animals to the rigours of the external elements.

The dwelling-houses, having at least three sleeping apartments, will give accommodation to the junior branches of the family, some of whom will be brought up to rural toil, and enter upon the profession of their parents. These labourers will be paid wholly in money, weekly, according to the rate of the locality. Proper accommodation and kind treatment will do much to incline the children to the rural occupation. On the other hand, a pinched allowance in every shape tends to drive them away from the most necessary and useful of all employments, to seek a better remuneration and more kindly feelings in some other grade of operations.

We think the practice of the young ploughmen lodging with their parents is preferable to their being boarded in the farmer's house: the example and authority of the parents are longer continued, and the contagion is avoided which always arises from a number of persons being congregated together, and which induces the one to follow the evil habits and customs that are presented to their observation by the other.

Nothing adds more comfort to the dwelling of a human being than an ample supply of fuel wherewith to cook the victuals with the necessary dispatch, and by the influence of warmth to banish every tendency to moisture and dampness, and preserve every perishable article in the proper condition of a dry existence. For this purpose, where coals abound and are cheap, the farmer incurs the expense of the carriage of the fuel, and the labourer pays the prime cost. A store of this most essential article is very conveniently provided when the teams of the farm are not particularly busy. In countries where timber forms the chief article of ombustion the farmer ought to incur the expense

of carriage, and further assist in arranging the purchases, and in making the payments easy.

The means of procuring the necessary education must not be overlooked, as it forms a very primary arrangement in every condition of civilised society. Reading, writing and arithmetic are branches that are most essentially necessary to every human being, and they must be carried to the utmost extent possible. For this purpose the communication of it to the labourers must be wholly "gratis," owing to the very low rate of wages which the circumstances of the present social system allows them, and which precludes them from being able to pay for their education. Every parish, according to its extent, should be provided with two or more schools, within easy distances that the labourers' children can walk from at a very early age, and continue till the time of entering upon the employment of labour: the funds necessary to uphold the schools to be levied upon the landed property. To this arrangement no valid objection can be made.

In all civilised and established communities no out-door work should be performed by females. The quality, as well as the quantity, of work has a very strong and visible effect on the female frame, both bodily and mental: the woman is thus degraded to the level of a beast of burden, and becomes destitute of the beauty and delicacy of her sex. Light work on the farm—as the harvesting of hay and corn, the hoeing of turnips, and the barn-work in winter—may be tolerated where it cannot be done without; but it must be observed that all out-door work has the most certain effect of vitiating the female character, and debasing every finer feeling. No better criterion of the civilisation of a people need be required than the general treatment of woman—in the respect which is paid them, and the estimation in which they are held. Any debasement of the human species must be avoided, and even prohibited.

As the wages of the labourer are utterly inadequate to enable him to obtain the comforts of life, and as labour is the most essential and valuable ingredient in all established communities, and consequently is entitled to the most humane attention, it is suggested that every parish clergyman be educated so far in the medical art as to prescribe in all common cases of illness, and thus join together the charge of the body and the soul. In extreme cases a professional man would be necessary, when the common means were found to require assistance. The medicines to be afforded by the landed proprietor would be a trifling item, but a vast advantage to the labouring poor. A legislative enactment would be required to enforce the medical qualification, of which no person

can doubt the vast benefit. Such an enactment is immeasurably superior to the ordinary occupation of legislation. Every consideration should be banished from the human mind, that has no relation to the well-being of our fellow-creatures, and for which reason can assign no grounds. As labour is the power that produces every enjoyment in life, it ought and must be the primary and chief consideration, that it be rewarded; and if not in the first award of value, that it be redressed and assisted by subsequent considerations, and for which the labourer has a just and inalienable claim. Every breath that is passed between the lips, every word which is uttered, every muscle of the body that is exerted, every footstep that is moved forwards, all the conceptions of the mind, and every feeling of the heart, joined with the actions of the hand, must point steadily and unerringly to that object which is the only sphere of occupation that is worth the time and attention of rational beings, that are in a state of sanity. The physical necessities claim the first notice, for upon them the mental superstructure is built. An improved animal physical condition may be obtained without a corresponding moral development; but no great mental improvements ever will be reached, without the essential physical nutrition that arises from a competence of the necessities of life. No mental emanations can proceed from a starved physical condition; the senses are callous, and the depositaries of transmitted intelligence are weak and incapable of entertaining ideas, and of making the proper deductions. Every faculty is benumbed, and every nerve of action is unstrung. Hence arises the very slow pace of human improvements; the greater part of mankind are placed and held in a condition that most completely and effectually forbids any attempts of individuals to emerge from it, except in a few cases of desperate resolve, severe struggle and privation. The emancipation and rise of the lower orders would accelerate and hasten the grand events of human perfections, not only in the numerical ratio of the multitude that would be brought into the path of onward progress, but in the multiplied aggregate of the mind, and the glorious manifestations that would accompany the unbinding and setting loose of so many imprisoned sparks of ethereal essence. Towards this purpose, the very first step is to place the objects within reach, and to shorten the distances of approach; to commence the ascent by affording the necessary aliment of an existence that looks to a more elevated and better state of being. Every individual class of society should be placed within the tangible reach of the upper gradations, and have a stable foundation whence to begin the ascent. When this stepping-stone is denied, the

flight will be very rarely attempted; and the world is deprived of the incalculable benefits that would accrue to the human race, from the mental aspirations and the practical resolutions of the number of intellects that are thus confined. Such an enlarged development of mental exertions would far outstrip the efforts of societies and of individuals, who join in a comparatively weak concert, in order to promote advancements in a ratio that is very frightfully reversed from the universal estimate that ought to prevail. Luxury is supported by

labour; and it is fair, it is just, it is reasonable—in fact, it is imperative that the duties which nature has imposed on the possession of the refined enjoyments of life, be on the other side performed. Humanity and duty in this case join their powerful voice in calling for the performance of the most necessary of all obligations, viz., the commencement of the extinction of the vast and accumulated debt of property to poverty, a debt that has no figures of calculation, nor any measure of extent.

## THE WOOL TRADE AND MEAT TRADE—FORESHADOWING THE CHANGE THAT MUST BE MADE IN OUR AGRICULTURAL SYSTEM—EXPLAINED.

BY AN EX-FARMER.

By taking warning we are often able to avert an impending calamity; and, by proper exercise of judgment, that which threatened to eclipse any branch of trade, or other ordinary occupation of life, may be dispelled, and the comfort of usual light maintained. Those persons who take warning in these cases, and turn their attention to proper account, are they who are rewarded for their trouble and industry, and this because they have acted for the relief of others of the great family. Great countries, that are divided and subdivided into interests, will ever experience, or rather exhibit, real oppression in some branch of trade or traffic that is followed by numbers of their people; but when these are foretasted, they are generally lightened by the exertion of the number or numbers that are likely to be directly interested. The natural jealousy of men has begotten an impression that the suffering of any branch of civilized occupations is relief and comfort to others; that is, it is thought that the loss of money by any branch of trade, or the prosecutors of it, is the gain of others. But this is a great mistake; for it is by maintaining the prosperity of itself that any interest can add to, and increase, the comforts of other parts of the community. Money is a very fascinating element of our present system of exchanging our productions; but it is a great error to suppose that it will add one fraction to our comforts if by obtaining it another class is deprived of the means of exertion. Experience will teach many of our present pretenders to philosophy, that it is to prosperous interests that we must look for increased comforts, and not to the result of depriving them of the means they require for exertion.

A great branch of trade, in which farmers are closely interested, is now threatened with suffering that it has never before experienced; and this by a serious falling off in the supply

of the raw material of the goods which form it. It appears that manufacturing of, and trading in, woollen goods of all kinds, and particularly of fine qualities, have increased very rapidly within the last twenty or thirty years, which have been maintained and encouraged by increased supplies of wool from our colonial possessions. The flocks of New South Wales have increased to so great an extent, that it is stated, on good authority, that the amount of about 120,000lbs. (which was exported from thence in 1828) has increased to the quantity of above 40,000,000lbs. per annum—at least this was exported last year. But now it is stated on good authority, and the imagination will assist in causing it to be accepted as a truth, that the gold mania in that country has tempted shepherds to forsake their flocks and masters, either without notice, or with that peculiar manner and speech which become the most prominent parts of illiterate people, when outward evidence beget an inward principle, that fortune and future independence may be obtained by a change in their actions. The discovery of much gold there has had that influence over the people of this character, that they have abandoned their former and accustomed mode of living, leaving the master of a flock to attend to and shear it himself. Ships have been deserted in the same way; and in both instances the love of the glittering metal was so powerful that no temptation in the shape of high wages would induce these shepherds and sailors to stop where they were. What will be the future result, as well as the present loss to the proprietors of these flocks, and the large number of industrious people that compose the class which depends on the supply of wool from that country for employment, it is impossible to predict. For if shepherds cannot be kept to protect the flocks from native injuries, such as ravages by wild dogs, and losses by straying and losing them-

selves in so wild a country, why it is very clear that the number of sheep will decrease as fast as they have increased, and the amount of wool we shall receive will decline in the same ratio.

It would not be a display of wisdom to retort upon this interest for the manner in which it has despised the home produce of wool, which has given employment to workers of the coarser cloths, and the supply of which has been materially reduced by the manner in which forced sales were effected in past years, and in 1848 in particular; and which reduction of flocks of this country was caused by the amount of expenses having to be made up by *quantity* of sheep sold; thereby causing that which was, or should have remained, as fixed stock of the farmer, to be marketable or circulating stock. It would not be compatible to follow the line of description and argument which we have been in the habit of receiving; but to exhibit in practice that which experience will teach people in general in due time—that in proportion as one influential interest suffers other interests must suffer indirectly, by participating in such deprivation. It is a loss to ourselves, moreover, to do the one; and it is profitable to do the other. Practical relief is profitable; for by supplying the demand of a number of people we receive a profit for ourselves, let that supply be composed of what it may. The probability of a rise in the price of wool, from the above causes, and the certainty of a rise in the price of mutton, are sufficient inducements for persons to turn their attention to the increase of their flocks of breeding and “feeding” sheep; and to consider them before the produce of corn of any kind, as we are so inundated by foreign countries as to cause a doubt as to whether it can be produced at the ordinary rate of interest on employed capital.

The importance of the above question may be pretty well understood by the fact that a large meeting of the manufacturers of the West Riding was lately convened, resolutions read and adopted, and a deputation appointed to wait upon the Colonial Secretary, with a view of inducing Government to adopt means by which this branch of trade might not be diminished. It is considered proper to send out English shepherds and shearers to protect and clip the flocks. But if this be done, it will be requisite to send a soldier to a shepherd; and the probability would then be that the two would connive together and start for the diggings. However, it may be remarked, without prejudice or ill-feeling, that if, as these manufacturers say, farmers must depend on their own exertions, without any reliance on Government—if this is to be the policy of the day, as they or their representatives say it must, why it can hardly be fair that a portion of the revenue of this country should be

appropriated to conveying men over the water to serve their end, by making wool cheaper, and thereby keeping down the price of home growth, the producers of which are unjustly contributing to the revenue in the shape of taxes on their own productions, and articles in which they are directly interested. If farmers are to depend upon themselves, and have no help from Government whatever, how can it possibly be expected that manufacturers can have their immediate interests and misfortunes interfered with? It seems but fair that they should practise their own policy; and, instead of fleeing to Government in such cases as these, “depend upon their own exertions.” To accomplish the object they have in view, if as important as they say it is, they may soon raise a private fund for the purpose.

Whilst manufacturers are devising schemes to protect the supply of wool abroad, it is the farmers' business to endeavour to increase that division of their produce which they may reasonably expect will advance in price. I have already urged the necessity of paying as much attention to the growth of sheep and wool as circumstances would possibly allow, as I was then confident that these would prove more profitable than any other part of the productions of the British agriculturist; inasmuch as more corn may be grown by sheep feeding than cattle feeding, as much weight of mutton as beef if made from a given quantity of feed, the fleece constituting extra profit—and the greater the price of it per pound, of course the greater inducement there is to carry out the system to its utmost possible extent. Mutton cannot be imported into these islands to any great extent, as no neighbouring country produces a large superabundance, and what is imported is of an inferior quality. But cheese, butter, pork, as salted, and hams and bacon, can be forwarded across the channel and Atlantic of good quality, being already very much improved, and in as good a state of preservation as they can be sent from any county in England to the London market.

The change necessary to be made in our present system of management is, the greatest possible amount of green crops must be grown, and instead of growing beans and peas between barley and wheat on middling land, a crop or two of some kind must be produced, such as rye and tares, winter oats, and so on, for spring feed, and then a crop of early white turnips (after the system already recommended) for autumn feed, which will leave the land in a far richer condition for after-crops of corn. Clover must be fed for the most part; and if there should not be enough feed for horses under this system, the deficiency must be made up by foreign beans, oats, and so on; or those persons who have been in the habit of buying

English feed for their trade horses must depend on foreign countries for a supply.

These are the changes that must be made in this particular part of our agricultural system, and this has been suggested by the increase of persons to an acre of land in our country, the readiness with which corn can be imported, and the perishable nature of animal matter. The prices of meat will shortly be high, considering we are open to competition with the whole world in corn, and what is produced by inferior sorts of it—meat. It is the person that watches the course of things, and has in readiness what he foresees thereby will be required, who makes the greatest profit by the turn of the times. And we have evidence enough to show that the supply of meat will shortly be limited throughout this country. Those persons who help to prevent its being too limited will be they who will benefit themselves. It will *not* be dear, although the demand will be greater than the supply, and this for no other reason than because much money is thrown out of circulation by the present policy of the *populace*. Prices will, however, rise as much as the amount of money afloat will admit of.

In regard to the management of sheep, they cannot be changed too often, as food of different fields varies in quality, and therefore flavour, and that which is trodden and pressed down rises and becomes sweet and tempting to the appetite. Fields should therefore be divided in proportion to the size of the flocks to be kept through the summer. If artificial food or corn be used, the kind and quality should be changed according as the weather changes the quality of the feed. Nothing can be so unskilful as to buy that which is cheap or weighty for money. When the air is moist for a day or two, and the weather wet for another day or two, that which will act as an antidote to the food of the fields, made relaxing thereby, should be given. Rye is the best; wheat of inferior quality is good; and old beans, particularly those that were grown in hot climates, as Egyptian. Price is so little to be considered, that it is here out of the question, as there is seldom a great variation from the usual relative value of such like commodities. When the weather becomes hot and dry, such things as act contrarily should be given as trough food. Bran, and other refuse of the mill; barley, which if "spear'd" or germinated would be the finest possible food for cattle of all kinds in hot, dry weather (and this may be urged as another element of the past reasoning against that odious tax on malt, rendered still more so by our present policy, as the excise would soon be about, not only the ears, but the effects of any one who had his barn floor, or any other floor, strewed with wetted barley); some-

times this trough food may be greatly reduced with propriety, and the stock of the granary reserved for a future time. When this may be done is when the season is advanced and there is plenty of seed in the clover, and the weather is at the same time genial, and therefore a fair quantity of leaves is admixed with the stalks and heads. The system of wetting barley for a day or two cannot be too strongly impressed on the minds of the readers, as I will stake the value of my inquiry into these matters on its efficiency; and there is no waste from grinding and "tolls," and no expense of cartage to mill and charges for the process, which amount together to more than the labour would be to prepare it for, and put it into, the troughs in the way suggested.

In cattle feeding it must not be forgotten that the faster any animals are fattened the greater profit there is upon them—when they are treated as nature intended they should be. For it requires a certain amount of food to support the *waste* of them under any circumstances, and this waste is no more per day when they are skilfully fed and fattening rapidly, than when they are increasing slowly in this way. Indeed, it is often less under the former circumstances, as they then rest contentedly, whilst under the latter they run what they had off their back again.

In regard to the produce of wool by management, there is, I believe, one material point overlooked; at any rate I have never heard it remarked upon or seen it in print. It is the dressing used to prevent the "fly" in sheep. The caustic properties of ordinary "fly-powder" *prevent more wool from growing* than the "fly" would cause to be cut off if no dressing were used. Some of this is so drying to animal texture, from the quantity of mineral poison it contains, that it turns the wool black, as is often observed where it has been applied. It does not require much consideration to conceive that the growth of this wool is stopped. Indeed, the backs of sheep are often made flat by it, and to appear as if they had been "top'd." Half a pound is frequently lost in this way; on long-wool sheep it is more. This subject is worthy of close attention; and any one who can give a receipt, or recommend the preparation from experience of its efficacy on the one hand, and harmlessness on the other, has the opportunity granted to him for distinguishing himself for his ingeniousness of disposition and honourable desire to increase the comforts of others when it can be done cheaply and without alarm for his own safety. The season for this application is coming round, and I know of nothing that would be more important to the readers of an agricultural journal than such information as that which I have said is more re-

quired than persons in general seem to be aware of. We are not manufacturers, and look upon our craft as suspiciously as if each competitor was a knave.

By showing others how to increase the bounty of nature we increase our own happiness. There is some philosophy at the bottom of that sentiment.

METEOROLOGY, ITS CONNECTION WITH AGRICULTURE.

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

In a previous number of this valuable Magazine (vol. xxxvii. p. 382), I alluded to the evaporation of water from the surface of soils. This exhalation is found to be materially increased when the ground is tenanted with plants. This portion of our enquiry has been well examined by Mr. J. Prestwich, in his able work "On the Water-bearing Strata around London;" and, as he well remarks, p. 118, we must not forget, in examining the rain-fall of any district, that the existence of vegetation must intercept a large portion of the rain. This, he adds, has been partially allowed for in the experiments of Dalton and Dickenson, in both of which the surface was covered with a growth of grass. But this is hardly enough; the more active and vigorous vegetation of the corn crops and of trees is productive of a far greater evaporation. What it may amount to has not yet been determined by a sufficient number of direct experiments. As an indication of the importance of vegetation in absorbing the rain-fall, I may mention that a tree of average size is supposed to yield by evaporation from its leaves about 2 to 2½ gallons of water daily; and in some recent interesting experiments of Mr. Lawes (*Jour. Hort. Soc.*, vol. v.) three plants of wheat or barley, grown in pots, gave off in the course of six months of their active growth nearly 1½ gallon of water; for every grain of dry produce, from either wheat, barley, peas, beans, or clover, 200 grains of water were evaporated.

*singault's Rural Economy*, by Law, 408); and then, as I am informed by Mr. Lawes, to subtract one-seventh of the weight as harvested, for water. We shall then obtain the following proximate results:—The rain-fall we may suppose to be 25 inches, which is equal to an annual fall of 564,934 gallons of water per acre, or 357,911,335 per square mile.

EVAPORATION OF WATER DURING GROWTH.

	Per acre. Gallons.	Per square mile. Gallons.
Wheat . . .	114,860	73,510,400
Barley . . .	93,189	59,635,200
Beans . . .	105,000	67,200,000
Peas . . .	97,720	62,540,800
Clover . . .	115,380	73,843,200

In calculating, however, the rain-fall in connection with the evaporation of water from the earth's surface and from plants, we must not forget the depth of dew which is annually deposited, as well as the absorption of the invisible moisture of the air by some soils. The annual fall of dew at Manchester was estimated by Dr. Dalton to amount to five inches; and according to the trials of M. Schubler, during a night of twelve hours when the air is moist, 1,000 lbs. of a perfectly dry

	lbs.
Quartz sand will gain . . .	0
Calcareous sand . . .	2
Loamy soil . . .	21
Clay loam . . .	25
Pure agricultural clay . . .	37

The moisture constantly found in the atmosphere at all seasons of the year is indeed, from its connection with the sustenance of plants, a very interesting branch of our enquiry. Its varying amount will be found in the subjoined table, which gives the mean weight of water, in grains, in a cubic foot of air, during every month in the year, at (I.) Greenwich, (II.) Aylesbury, (III.) Derby, (IV.) Liverpool, (V.) Helston (*J. R. A. S.*, vol. xi., p. 25)—

	I.	II.	III.	IV.	V.
January . . .	2.2	2.4	2.5	2.4	2.6
February . . .	3.0	3.0	2.8	3.1	3.5
March . . .	2.9	3.0	3.0	3.0	3.2
April . . .	3.1	3.3	3.1	3.2	3.5
May . . .	3.9	4.6	4.5	4.1	4.3
June . . .	4.3	4.9	4.6	4.3	4.6
July . . .	4.8	5.2	5.2	4.8	5.2
August . . .	4.5	4.8	4.9	4.4	5.0
September . . .	4.2	4.2	4.6	4.4	4.7
October . . .	3.8	5.9	3.9	3.7	4.0
November . . .	3.0	2.8	3.1	3.1	3.4
December . . .	3.1	3.0	3.1	3.0	3.7

This will enable us to form some general estimate of the evaporation caused by the same description of vegetation on any given area. Professor J. F. Johnston, in his Lectures on Agricultural Chemistry, p. 927, calculates that the average gross produce per acre of these crops, supposing the wheat to yield per acre 25 to 30 bushels, the barley from 35 to 40 bushels, the beans 25 to 30 bushels, the peas 25 bushels, and the clover 2 tons, will be as follows:—

	Seed. lbs.	Straw. lbs.	Total. lbs.
Wheat . . .	1750	3300	5050
Barley . . .	1935	2300	4285
Beans . . .	1700	2950	4650
Peas . . .	1650	2700	4350
Clover . . .	4480	—	4480

To these totals, continues Mr. Prestwich, we have to add the weight of the stubble and roots, which may be taken roughly at one-half of the weight of the straw (*Johnston*, p. 745, and *Bous-*



It will also be useful, as well as interesting, to notice not only the ordinary mean amount of insensible vapour in the atmosphere. but the proportion needed to saturate a cubic foot of air. This will be found in the following table, which shows both these objects of agricultural meteorology, as they presented themselves in the year 1847, and in the quarters ending June 30 and September 30, 1848, at different stations. In this the weight in grains is given; columns marked I. being the weight present, and columns II. the weight needed for complete saturation (*Phil. Mag.*, vol. xxiii., p. 374; vol. xxiv., pp. 192, 271)—

	1848.					
	1847.		In Quarters ending			
	I.	II.	June 30.	Sept. 30.		
Helston . . .	4.1	0.6	4.0	1.0	4.8	0.9
Exeter . . .	3.5	1.1	3.7	1.4	4.9	0.9
Brighton . . .	3.6	0.6	4.0	1.1	—	—
Southampton . . .	—	—	4.0	0.9	5.0	0.7
Uckfield . . .	3.6	1.1	3.9	1.7	4.5	1.8
Beckington . . .	3.7	0.5	3.8	1.0	4.4	0.9
Greenwich Obs. . .	3.6	0.8	3.8	1.4	4.5	1.1
Aylesbury . . .	—	—	3.8	1.5	4.4	1.2
Highfield, Nottinghamshire . . .	3.7	0.8	3.8	1.1	4.4	1.0
Liverpool . . .	3.3	0.6	3.6	0.8	4.2	0.8
York . . .	—	—	—	—	—	—
Whitehaven . . .	3.2	0.6	3.7	1.1	4.3	1.2
Durham . . .	3.1	0.8	3.5	1.0	4.1	1.1
Newcastle . . .	—	—	3.9	1.2	4.5	1.2

As I had occasion to remark in another place (*The Farmers' Almanac*, 1852), closely connected with the influence of the rain-fall on the agriculture of a district, is the mean cloudiness of the climate; since it is evident that, all other things being the same, those districts which are the most clouded will need, to produce a given result of vegetable growth, less rain than where the sunshine is less impeded. Now in the years 1847 and 1848, at thirteen different English stations, the degrees of mean cloudiness (supposing complete cloudiness to be equal to 10) were thus recorded (*Phil. Mag.*, vol. xxxii., p. 517; vol. xxxiii., pp. 194, 374; vol. xxxiv., pp. 192, 271)—

	1847.	1848.			
		Quarters ending			
		Mar.	June	Sep.	Dec.
Helston . . .	5.9	3.1	3.0	3.0	3.1
Falmouth. . .	—	7.3	5.6	6.3	7.4
Brighton . . .	6.0	6.4	4.3	—	—
Beckington . . .	4.9	7.1	5.4	5.8	6.3
Greenwich . . .	6.8	8.0	5.9	6.4	6.9
Lewisham . . .	4.9	—	—	—	6.5
Walworth . . .	6.3	8.2	5.7	4.0	—
Aylesbury . . .	—	7.5	5.8	6.6	6.8
Cambridge . . .	6.9	—	6.4	—	—
Highfield House . . .	6.1	7.5	6.2	6.3	6.7
Liverpool . . .	5.7	6.3	5.9	6.7	7.0
Stonyhurst . . .	—	8.0	6.8	7.4	7.2
Durham . . .	—	6.4	6.0	5.8	6.1

Then, again, the nature of the prevalent winds, their degree of dryness or moisture, materially influences the success of the husbandman's crops. This, however, will form the subject of a future paper.

The farther we advance then in these researches, the more we study the ultimate connection which exists between the meteorology of a district and the crops which tenant it, the more interesting and practically instructive they become. It is idle to say that they tend to no practical result, for they lead to many (and it is probable that others will be discovered hereafter). They teach and serve to explain many a phenomenon in vegetation—they explain and promote the adoption of improved systems of cultivation. We may remember that the modern English agriculturist adopts systems of tillage—courses of cropping, which the genius of Jethro Tull long since, in a far less informed age, led him to unsuccessfully advocate; Tull, in fact, was perhaps the first English farmer who saw the vast amount of nutriment existing in the air—he was not, indeed, aware of what that food was composed; the term gas was then hardly known; the word air in his time expressed all the ideas of his chemical contemporaries upon gases of all kinds. In spite of this want of chemical knowledge, Tull had somehow or other discovered the great fact that the atmosphere contained something which operated as the food of plants; from this knowledge proceeded his warm recommendation of the deep and fine tillage of the soil, and of planting crops in rows by the drill, and at wide intervals, so as to promote the circulation of the air. The whole history of the Tullian system of agriculture—of the difficulties it encountered, of the ridicule it met with, and the solemn arguments it had to answer—offers indeed an instructive and amusing commentary upon the very subject of this paper, viz., the connection of the meteorology of a district with the cultivation of its soils; indeed, we may, in the course of these examinations and gatherings, have more than one occasion to note how very injurious to the progress of our knowledge is a tendency to undervalue any discoveries, or any knowledge which appears contrary to the popular notions of the existing generation.

## PREPARING LAND FOR A GREEN CROP.

BY G. DUNCAN.

To the farmer of the present day it is indispensable to have a part of his land in green crop—that is to say, turnip, potatoes, carrot, mangold, beans in drill, and sometimes cabbages. One, or all of these plants are decidedly required in good farming, and where they are grown to perfection, the land must be in good condition, and clean and clear of weeds, else the green crop will suffer “high robbery.” Where the soil is a dry friable loam, some farmers are in the practice now of cleaning their green crop land in the end of autumn by grubbing and harrowing, till the weeds are brought to the surface and destroyed. This plan does remarkably well where it is practicable to do it, but in heavy loams and stiff clays it cannot be well followed out. On heavy land intended for green crop it should be made as clean as possible before either manure or seed for a crop is put into the land; to accomplish this, put four horses to the plough for the stubble furrow in the end of autumn, and if the furrow can be turned over a foot or more deep, so much the better; don't be afraid to turn up the subsoil, winter will temper that; frost acts with more effect on subsoil than it does on surface that has been long exposed to the weather and under cultivation, and a green crop luxuriates in subsoil when it is well mixed through the old surface. Be it remembered that although four horses are employed in one plough, and half the ground gone over that would be done by two ploughs, yet there will be no loss by the end of spring in the forwardness of the work, because the spring ploughings will be comparatively light, as half the depth of furrow will be sufficient then, and two-thirds of the weeds are buried to rot, and trouble no more, at least what are generally called root-weeds, and the seeding or annual weeds will be easily dealt with on the fine mellow surface. It is no doubt evident to those well versed in farming, that where summer fallow is in disuse, there is no other crop in the rotation when the land can be cleaned effectually, but in the year that it is in green crop. It is yet a custom with many to depend on cleaning their land among the green crop while that crop is growing, instead of doing it before the plants or the seeds are put into the ground at all; this is a slovenly way, and the sooner that it is thrown out of fashion, the land and the farmer will be the sooner benefited.

The practice was too long followed of giving the

fauching, or autumn furrow, as shallow a furrow-slice as could be turned over, just covering the stubble and weeds, and no more, and having full intention of ploughing 2 or 3 inches deeper in spring. Spring came, the bottom soil under the thin furrow had got so hard and dry that two horses were not able to draw the plough at the required depth, and four horses to the one plough could not be spared at this season; the consequence was, an inch or two deeper than the autumn furrow was turned up; then the surface presented a mixture of clods and weeds, that took a severe round of labour in rolling, grubbing, harrowing, &c., to make it ready for manure and seed, and after all not half cleaned. In early summer the weeds were doing battle against the sown plants, and appropriating for their own use half of the manure at least. The wonder is that so many farmers still go on in this defective way of managing their green crop; certainly, they cannot expect to clean their land. No doubt that sometimes a very fair crop is raised, but still there is considerable loss in the long run.

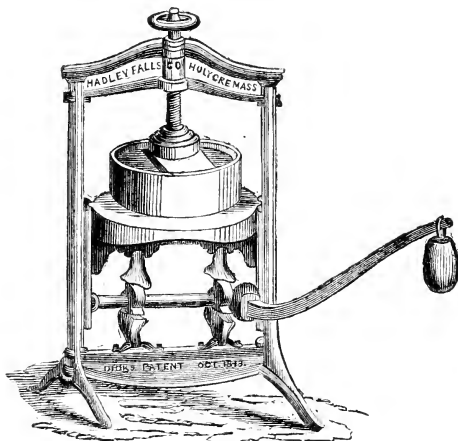
There are many well-managed farms where the land is comparatively clean at all times; on such farms the land has little use for the deep four-horse furrow at the autumn ploughing, as when the field presents a fine clean stubble and few perennial weeds. Allowing the weather to be good, and the land to be in a dry state, a good plan is to cart on the dung, and plough it in by the autumn furrow; this way saves poaching the land in spring by carting on it, for the carting on stiff loam and clay soil should be avoided as much as possible, should they be at all rather wet. Some people may say, Why write about this, it is all known already? Allowing it is known and acted too, yet it is the exception, not the rule; and moreover a good tale is no worse of being twice told, and I know it to be a prevailing notion with many farmers that deep ploughing and turning subsoil up to the top is injurious: I own it is, in some cases, when followed by the cereals or white crop, but never to the green crop. When a gardener trenches his ground, we do not find him keeping the surface soil always uppermost; he pays no respect to this! he turns the subsoil uppermost without the least concern about its qualities; his crops may be said to be all green ones, and the weather of one winter puts the subsoil all to rights for a superior crop in the following summer, and for years afterwards.

One grand point in the cultivation of land is to keep a proper equilibrium of the organic and inorganic portions of the soil, and it will be found that in almost all land that has been long under cultivation, the organic constituents of the soil predominate sometimes to such a degree as to give the land the term "worn out." To cure this, turn up a quantity of the subsoil, and this operation can be best performed in the end of autumn, or in the begin-

ning of winter, and it is not of much consequence, although the land be rather wet at the time of this deep ploughing. In the final cleaning and working the green crop land in spring, never allow a horse or an implement to go on it when it is too wet. Better to have men and horses idle in wet weather, and strive to do extra work on a fine day.

*Ayrshire, Nov. 12, 1852.*

### DICK'S CHEESE PRESS.



This admirable press, made mostly of cast-iron, was lately exhibited at Geneva on the grounds of the New York State Agricultural Society by J. E. Holmes, of Holyoke, Mass., from which we have made the above figure. This press is remarkable alike for its ingenuity, simplicity, efficiency, and durability—and may be used for centuries without getting out of order. Figs. 1 and 2 show the manner in which the platform supporting the cheese is elevated by depressing the lever and weight. Fig. 1 exhibits the appearance with the lever *a* raised, and Fig. 2 the same borne down; the surfaces in contact merely rolling over each other, there is little or no friction. It is regulated by the screw operating in the upper bar. In order to try its strength, one of these machines was strained till it broke, when it was found that the pressure was equal to sixteen tons. Hence they are warranted to sustain a force of ten tons. We placed blocks of wood as large as a brick in the press,

and found by the force of one hand on the lever that these blocks were flattened and the sides swollen out as if they were but bags of sand. The price of the press is 25 dollars, and it is doubtless the cheapest thing of the kind for large dairies.

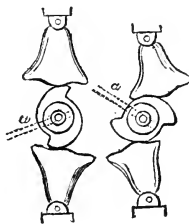


Fig. 2.

Fig. 1.

## EXPERIMENTS ON THE FATTENING QUALITIES OF THE HAMPSHIRE AND SUSSEX DOWNS.

We have this day noticed Mr. Lawes' experiments on the fattening qualities of the Hampshire and Sussex downs, and given a very epitomised synopsis of the results of his experiments. It is the beginning of a series of interesting tests to show the mutton-producing power, in proportion to the food, consumed by the different varieties of sheep. Mr. Lawes has carried on his plans, and subjected the Cotswolds to the same course; having, however, originally intended them for a comparative trial with the New Oxwards; but failing in this, he tried the fifty sheep alone, on different qualities of food, and subjected them to a comparison with the two kinds of downs he had before tried, as to their fattening adaptation.

He commenced with the flock selected by Mr. Garne, on the 24th of October, and fed them on turnips in the field until the 21st of November, when he put them on boards or rafters, and then fed on oil-cake, clover-chop, and as many swedes as they would eat.

The same proportion of dry food was allotted to the Cotswolds in proportion to their weight, which was 113½ lbs. average per animal. The food at first given was 1 lb. per day each, of clover chaff, and the same of oil-cake—near the conclusion of the experiment the oil-cake was increased by one half. The average weight on the 1st of December was 119 lbs. 14 oz.; but there was a difference between the greatest weighted animal 146 lbs., and the smallest 103 lbs., which showed how great a variation there may be in a lot pretty nearly equal in appearance.

Mr. Vernon Harcourt showed what great differences of produce would take place in the same field in various parts similarly treated, and Mr. Lawes' experiments show the same thing of the different animals.

In the first month of the experiment after the weighing alluded to, the increase was in a margin from nil to 22 lbs., nor could previous weight or any other element account for the difference. The weekly average gain per head was 3 lbs. 10<sup>7</sup>/<sub>16</sub> oz. during the month.

In the second month the extreme variations of increase were 1 lb. against 22 lbs.; but it is very remarkable that it was neither the one which had been the greatest gainer the preceding month, which increased the most, nor *vice versa*. Though it comes out in the long run that the one which

gained the most was that which realized the greatest amount at the end of the experiment. The average gain in this month was less, being only 3 lbs. 3<sup>7</sup>/<sub>16</sub> oz. per head per week.

In the third month the greatest increase was again 22 lbs., and the smallest 3 lbs.; and it is again remarkable that the one which gave the smallest increase in the second month was that which progressed the most in the next. The average gain fell, however, to 3 lbs. 6<sup>1</sup>/<sub>2</sub> oz. per week.

In the fourth month the lowest increase was again 3 lbs., and the highest 28 lbs., the latter being the same as stood highest in the second month. The average increase was 3 lbs. 5 oz. per head per week.

Without pursuing the subject further, we may say that the final mean weight, without wool, was 174 lbs., the highest weight 214 lbs., and the lowest 147 lbs. The highest average per week, increase was, as we stated, the one before particularly referred to, which averaged 4 lbs. 7 oz., the lowest 1 lb. 14 oz., an average of 3 lbs. 2<sup>1</sup>/<sub>2</sub> oz.

The increase in twenty weeks per 100 lbs. of live weight took 259 lbs. 11 oz. of oil-cake, 219 lbs. 1 oz. of clover hay, and 3,608 lbs. of swedes.

Now the comparison with the Downs of the two kinds before referred to is as follows:—The

	lbs.	oz.
Cotswolds gained per week.....	3	2½
Hampshire Downs „ .....	2	12
Sussex Downs „ .....	2	1¾

But there was a difference in the food. The Cotswolds consumed more food—more of every kind than the Sussex Downs; and more, very slightly, of all but the clover-hay, than the Hampshires. But then they had a larger frame, and produced greater results. Taking the 100 lbs. increase, for instance, as the test, as it ought to be, the result is in every way in favour of the Cotswolds, as the following will show:—

	Cotswolds.		Hampshires.		Sussex.	
	lbs.		lbs.		lbs.	
Oilcake .....	239 <sup>3</sup> / <sub>16</sub>	..	294	..	314	
Clover Hay ..	219	..	259	..	304	
Swedes .....	3601	..	3941	..	4086	

The increase in weight per 100 lbs. was about 2 per cent. greater with the Cotswolds.

The “balance-sheet,” always so satisfactory, is not here of the same consequence as the experiment. It is not likely that when the animals are

so confined and often weighed, so much can be defined as to make *profit* a clearly guiding element. The cost of his sheep he makes £66 10s.; the quantity of purchased food consumed by oilcake and clover-hay, £29 6s. 5½d.—a total of £95 16s. 5½d.; while the proceeds of the sale were £92 3s. 7½d., a small difference of £3 12s. 10d. in the lot with the manure, for the risk, return for capital, land crop and Swedish turnips; but they were sold at a "heavy" market, and thus may partly account for the loss.

There is one curious fact in this and the preceding experiment, which we cannot help noticing. Mr. Lawes observes that there is some general uniformity observable in the quantities of food in *their fresh state*, consumed by all the three kinds of animals, per 100 lbs. live weight weekly. "But when the quantities of the respective foods are calculated each to their contents of dry substance, it is found that the total quantity consumed to a given weight of animal, within a specified time, is *all but absolutely the same for the three breeds.*"

Now this opens to our view a wide field of the most difficult and delicate investigation. Are all breeds to be considered so nearly similar that they take per 100 lbs. live weight nearly the same amount of dry food per week? Of the three dissimilar kinds—at least, two of them—this seems to be correct. How far it is so of the other breeds, time only will decide. But is the farmer to say that they are therefore all alike to him? No such thing. Take the Sussex Down, for instance: it consumed 9 or 10 ounces per week, per 100 lbs. weight more of clover-hay than the Cotswold; but it consumes several less Swede turnips. Now in some localities, and to some farmers, turnips are difficult, and clover-hay easy of attainment. Here a class of sheep is indicated, which, if this experiment is an invariable test, will answer his purpose. Besides, weight for weight calculated dry, vegetable matter differs in price very materially; and as this is the real question with the farmer, may he not some day be able to apportion his kind of sheep to his description of food, and so make profit? We hope so, or what will become of him?

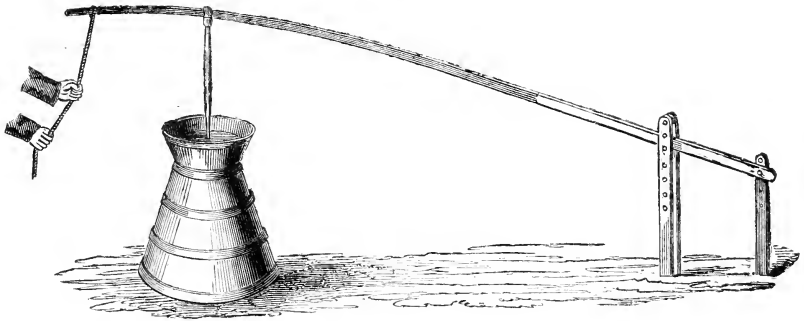
SUGAR BEET.—"W. F. B.," County Cork, asks—1. What is the best seed to use, and what quantity would you recommend to the statute or English acre? 2. As the percentage of sugar depends much on the manure used, what cultivation would you consider most judicious? 3. Would you

recommend sowing in tillage or stubble land, with a deep, boggy soil, which had been thorough-drained, and at what time? 4. Please say whether sugar beet would bear carriage to market, what may the average crop be per acre, and average price per ton?—1. The Silesian beet, the most esteemed varieties of which are the green-topped and the rose-coloured; 4lbs. of seed will be ample for the statute acre. 2. Nitrogenous manures, of any sort, though applicable to the production of large roots, is not applicable when sugar is the object—in short, the best mode of producing roots abounding in sugar is, to cultivate the crop after corn, or other crops which have been preceded by a manure crop, and not to apply the manure directly to the beet. 3. Beet is produced of fine quality in reclaimed bog, subject to the above management; but the best soil for sugar beet is a deep, rich, alluvial one. The crop should be sown by the end of April or beginning of May; and its cultivation is similar to that of mangel-wurzel in every particular. 4. It bears carriage; but its saccharine qualities are much injured by wounds or bruises. The weight of crop depends altogether upon the quantity of manure applied, and may be from 20 to 30 tons per Irish acre. Under like circumstances it yields in roots about one-fourth less than mangel-wurzel. The manufacturers expect to get it at from 12s. to 15s. per ton.—*Irish Farmers' Gazette.*

#### EXTRAORDINARY SALE OF COCHIN-CHINA

FOWLS.—One of the most interesting sales we have ever witnessed came off under the able auspices of Mr. Trafford, auctioneer, at the Bazaar in Baker-street; and we hope it is a prelude to something better, for with the growing feeling in favour of poultry, both as an amusement and an important feature in our domestic economy, we must have a metropolitan show of poultry, and no longer oblige their admirers to travel far into the country for an opportunity to compare their specimens. We are led to the foregoing observations from noticing what has taken place at the above yard in November last, in the sale of Mr. Sturgeon's Cochin-China fowls, and again on Thursday and Friday in last week: there cannot be a second opinion but that the Bazaar is the best place for such an exhibition. At the sale of Mr. Sturgeon's splendid fowls, wet as the day was, the place was filled, and all were much delighted with the sight as a show, and a first-rate one too, as surprised that 170 almost faultless specimens could be produced in one yard. Of the sale itself there seemed to be but one opinion—admiration of the fowls, and among the initiated, surprise at the prices; and certainly we must consider it one of the most extraordinary sales that ever took place, and there must have been much confidence in the breeder, quality in the birds, and emulation amongst those in attendance, to have produced £609 for 170 chickens!! It is true that Mr. Sturgeon's breed stands at present unrivalled; but superior as his birds unquestionably are, an average of £3 11s. is what we were not prepared for. Amongst those present we noticed Lord Ducie, Mr. Wakeley, Sir Eneas M'Donald, Messrs. Punchard, Johnson, Gilbert, Steggall, Fletcher, Catlin, Ambler, Reynolds, &c. &c. A curious fact occurred at the sale of lot 12; when the hammer fell at £7, a foreign gentleman present exclaimed, "Seven pounds—can that be for *con hen!*" The highest price was £12 10s., given by Mr. Hodgkinson for a cockerel by "Jerry," hatched the first week in April last.

## SIMPLE CHURNING MACHINE.



The above is an illustration of the old-fashioned pump churn, in every-day use throughout the country. The best description of pole is a young larch tree; it may be large or small, according to the size of the churn, and the quantity of milk to be churned. The end of the pole is pinned fast to a stake, and a little further on, it must rest on some kind of support, no matter what, so that it is solid, to which it must be made fast, or held firmly by, as it is from this point the spring commences. The degree of elevation must altogether depend on circumstances, such as the height of the dairy ceiling, that of the churn, &c.; but it will

be perceived by the sketch that this can be readily effected. The dash should be affixed about two feet from the top of the pole, this part forming a lever to assist the force necessary to pull down the pole; its own spring rises up the dash, and, once in motion, the least force keeps it going. Stakes may be put down outside the dairy window, through which the pole may come, and be set up or taken down in a few minutes. There is a great object gained by this simple contrivance—one person can do the whole of the churning, without stopping the dash for an instant.—Irish Farmers' Gazette.

## CHLORIDE OF LIME A PREVENTIVE OF SMUT IN WHEAT.

By WILLIAM E. STEELE, M.B., ASSISTANT SECRETARY TO THE ROYAL DUBLIN SOCIETY, &c., &c.

An experiment, of which the following is a detailed account, with the view of determining the value of chloride of lime as a dressing for wheat, was conducted in the Botanic Garden of the Royal Dublin Society, under my superintendance. In the spring of 1850, 4lbs. of the finest and cleanest wheat-seed was procured, 1lb. of which was set apart without any preparation. The remaining 3lbs. I caused to be mixed with a large quantity of smut or bunt (*Uredo caries*), sufficient to colour the seed uniformly of a light brown colour, in order to infect the seed with the fungus. One pound of this infected seed I then steeped for hours in a saturated solution of chloride of lime—common bleaching powder—and, in separating it from the solution, mixed it with some dry sand, in order to render it more easy to be sown. The third pound was steeped in a saturated solution of Glauber's salt; and after two hours, it was taken out, and dried by sifting some quicklime over it—a dressing found by the French Commissioners who reported on this subject to be the best which they employed. The fourth pound of seed (infected) was not subjected to any further treatment. These four parcels of seed, thus differently treated, were then sown in four separate plots of ground. No difference in the period of sprouting or germination of the seed was observed. But the result of the experiment, which was apparent while the crop was standing, is set forth in the annexed table. Plot No. 1, sown with 1lb. of clean undressed

wheat-seed; No. 2, 1lb. of infected seed, steeped in solution of chloride of lime; No. 3, 1lb. of infected seed steeped in solution of Glauber's salt, and dried with quicklime; and No. 4, 1lb. of infected seed, undressed. One pound of the ears of the produce of each plot, cut close off, was counted, and the number of the sound and smutted ears recorded. In the same manner, the number of straws in one pound, deprived of the ears, was ascertained. The following are the numbers of each:

Plot.	Total No. of Ears in 1lb weight.	Number of sound Ears in 1lb. weight.	Number of smutted Ears in 1lb. weight.	Number of Straws in 1lb. weight.
1	336	336	None.	234
2	364	362	2	268
3	632	352	320	278
4	700	360	240	330

Among the numerous deductions which the foregoing estimation warrants, one is quite obvious—that the chloride of lime dressing is far more efficacious as a preventive of smut or bunt in wheat than the dressing so highly recommended by the French Commissioners, insuring not only the grain from the attacks of the fungus, but preventing the deterioration of the straw which this *Uredo* appears also to occasion.

## AGRICULTURAL BIOGRAPHY.

*(Continued from page 499.)*

## LXXXI.—TULL, 1731.

Jethro Tull was a gentleman of an ancient family in Yorkshire, which had been seated in the county of Oxford, and possessed a landed estate there. He was born on the paternal property in that county, but not known at what precise date of time. He was educated at one of our universities, adopted the legal profession, became a member of Staple Inn, and was called to the bar in December, 1693, by the benchers of Gray's Inn, though generally said at the Temple in most accounts of his life. He made the tour of Europe, and was a keen observer of the soil, culture, and vegetable productions of the countries which he traversed. On his return to England he married, and settled on his paternal farm in Oxfordshire, where he began to introduce a number of agricultural experiments, among which he contracted a pulmonary affection, which sent him to Montpellier to seek a cure in the mild latitudes of Italy and the South of France. Here he attended most diligently to the culture of those countries—writing facts and drawing inferences with a very keen and ardent speculation. He returned to England with repaired health but dilapidated fortune—part of the Oxford estate was sold before his departure, and he now settled with his family on a farm of his own, called “Prosperous Farm,” near Hungerford, in Berkshire, where he adopted the firm resolution to perfect his former inexperimental undertakings.

Mr. Tull had very early observed the chance practice of gardeners in planting beans in rows, and in Lombardy he saw leguminous crops hoed and cleaned of weeds by means of the seeds falling into the seams of wide ploughing, and rising in rows or drills, which had descended as practice from the ancient Romans. He conceived that all plants used for crops should be placed in rows, and hence came the theory of drilling the ground for being planted. Tull had also noticed the great benefits of the soil being pulverized, or minutely severed in the particles; he had read on the subject, as the observation was as old as any records exist. On these two principles he set to work on his farm, and experienced the usual difficulties that attend all new undertakings. The soil of the farm was not favourable to the drill cultivation; the old implements were unsuitable and clumsy; the workmen were awkward and unwilling, and, as

usual, would break the new implements in order to continue the lazy working of the old ones. In the midst of these difficulties the expenses were much enhanced, and the usual condemnation was passed on the absurd attempt. But the utility became evident, and Tull was induced by the neighbouring gentlemen who saw its value, to publish his theory, which he did in 1731, in folio, price 6d., called “New horse-hoeing husbandry, or an essay on the principles of tillage and vegetation.” This work was only a specimen, and was followed, in 1753, by “Horse-hoeing husbandry,” folio, price 10s. It has lately undergone some alterations and additions, and was published by Mr. Cobbett in 1829. Tull died in January, 1740, at his seat at Prosperous Farm. He had a son, John Tull, who proved an adventurous genius, being a good mechanic, and had various success in different inventions. He first introduced into England the travelling by post-horses, for which he obtained a patent in 1737. He served in the army, resumed his schemes, and, not having capital to forward the undertakings, he was arrested for debt, and died in prison in 1764. His exit is often erroneously attributed to his father, who ended his days on the farm in Berkshire, as above stated.

Jethro Tull commenced his system of husbandry by making the ridgelets of land three feet apart, and planting upon each ridge two rows of vegetables in a nine inch distance. The wide intervals were wrought by the horse-hoe, and the narrow ones by the hand-tool. It does not appear that his ideas ever advanced beyond this conception, or that he had ever contemplated the uniform ridging of land over extensive fields. His construction of new implements would necessarily be imperfect, as all new ideas must be on almost any point, and hence the bad success of that, and most similar undertakings, where many influences concur to present an opposition. Ardent temperaments are generally deficient in the solidity that is required for an efficient practice, and it needs much longer time than the life-term of one individual to bring into any degree of perfection the attempts of genius, however they may be plausible and easy of attachment. Tull succeeded as well as circumstances would allow—his means, time of life, nature of soil and climate, unmaturing state of ideas, and the customary oppositions. He showed a grand principle, and left to others the development of its action.

Our author derived the idea of sowing grains by machine from the rotary mechanism of an organ, which laid the foundation of all sowing implements. His drilling of land produced every ridging of ground that has been done, and his ideas of the pulverisation of soil superseding the use of manures have led to the continued practice of reducing land to the finest possible state. It required more loamy soils than are found in South Britain, and a cooler climate, with more frequent rains and dews, to show the full value of Tull's conceptions on the drilling of green crops. Where he operated the main elements were against him, as is now evinced by the best modern practice. On the other hand, the drilling of grains succeed well in dry climates; but the placing of these vegetables in rows yet remains to be of doubtful value. Tull's practice died with him; but his book got into the hands of Tweedside farmers, one of whom failed in his attempts to establish the system on an unfavourable soil, and the other succeeded on gravelly loams, and pushed a most unexampled success. The Norfolk two-horse plough led to the single drilling of land, and Tull's hoeing and scarifying of land by frequent movements of the soil have completed the modern system of green-crop cultivation.

The name of Tull will ever descend to posterity as one of the greatest luminaries, if not the very greatest benefactor, that British agriculture has the pride to acknowledge. His example furnishes the vast advantages of educated men directing their attention to the cultivation of the soil, as they bring enlightened minds to bear upon its practice, and look at the object in a naked point of view, being divested of the dogmas and trammels of the craft with which the practitioners of routine are inexpugnably provided and entrenched. His system most completely revolutionised the whole practice of British agriculture—a proud pre-eminence certainly for any individual to attain. The full benefits have not yet been derived, for the clay lands remain to be subdued by the action of pulverization after the loamy soils and light lands have been exhausted by the application.

Tull pushed his theory to the extreme of supposing that a very minute pulverization of the soil would supersede the use of manure, and that the process would enable the land to produce a continued succession of crops in any kind of the suitable plants, even of the same vegetable in the yearly growth. Experience has not yet sanctioned this result; but if Tull failed to show this extreme use of pulverization in superseding the use of manures, he has amply succeeded in proving a comminuted condition of the soil to be very highly favourable to the action of every fertilizing sub-

stance. It is an inherent quality of genius to make erratic strides; and as the danger of mistakes is ever much greater than the means of avoiding them, a satisfaction must be entertained when the success bears any tangible degree with the failures. In Tull's case the ratio is large and the fall insignificant.

Amateurs in farming yet make pilgrimages of curiosity to the "Prosperous" farm of Jethro Tull, where the out-buildings remain in some part of the houses as they were used by the father of the drill husbandry. The dwelling-house is modernized, and the locality is found in the parish of Shalborne, under the Coomb Hills, about four miles south of Hungerford. No stone or memorial of any kind marks the grave of Tull—it is even unknown where his mortal remains were laid. Such was the reward of a genius which was always genuine, and never went to bed.

#### LXXXII.—MILLER, 1731.

Philip Miller, F.R.S., was gardener and botanical demonstrator to the Apothecaries' Company, at Chelsea, which office was held by his father, whom he succeeded in 1722. He was born in 1691, and died in 1771. Miller published largely on gardening and botany, and translated into English from the French language, "The elements of agriculture," by Duhamel. No work of Miller's is written expressly on agriculture, but bearing a close relation to it; his name is usually included in the lists of authors on rural subjects. His works are—"Gardener's and florist's dictionary; or, a complete system of horticulture," 2 vols., 8vo., 1720. This work passed through six editions. "A method of raising some exotic seeds, hitherto reckoned impossible," appeared in the "Philosophical Transactions" of 1724. "An account of bulbous roots" had a similar publication. "A catalogue of trees, shrubs, and flowers, which bear the open climate of England," 1730, folio, coloured plates. "A catalogue of the plants in the Botanic Garden at Chelsea," 1730, 8vo. "The gardeners' calendar," 8vo., 1731. This work had much popularity, and passed through several editions. "Figures of plants to illustrate his dictionary," 2 vols., 1730. "The method of cultivating madder," 4to., 1732. "Elements of agriculture, from the French of Duhamel," 2 vols., 8vo., 1734. Besides several essays and letters on scientific subjects.

#### LXXXIII.—ELLIS, 1732.

William Ellis was a farmer of Little Gaddesden, near Hemel Hempstead, in Hertfordshire, and evidently a person of intelligence. He travelled much both in this country and on the continent, and gave



to the world the following works, as the over-flowings of his knowledge:—"Practical Farmer, or Hertfordshire Husbandman; containing many improvements in husbandry," London, 1732, 8vo. "Chiltern and Vale Farming explained," London, 1733, 8vo. "New Experiments in Husbandry," London, 1736, 2 vols., 8vo. "The Timber Tree improved, or the best practical methods of improving different lands with proper timber," London, 1738, 8vo. "The Modern Husbandman, or practice of farming," London, 1744, 8vo. "The Country Housewife's Family Companion, or profitable directions for whatever relates to the management and good economy of the domestic concerns of a country life, according to the present practice of the country gentlemen, yeomen, and farmer's wives, in the counties of Hertford, Bucks, and other parts of England," London, 1758, 8vo., price 5s. "The Complete Planter and Cyderest, or a new method of planting cyder-apple and perry-pear trees, and the most approved ways of makin cyder," London, 1757, 8vo. "Ellis's Husbandry abridged and methodised," London, 1772, two vols. 8vo., 10s. 6d. A sort of compound of the whole of Mr. Ellis's works on agriculture.

"Chiltern and Vale Farming explained" forms an octavo volume of 400 pages; and treats the cropping of sour clay lands, with the common grain and leguminous plants; the natural and artificial grasses; ploughing in general; seeds; weeds; liquor for a corn steep; horse-hoeing; turnips, use and value; manures in general. The wheel-plough, with two mould-boards, is figured and largely described; and the author seems very fond of its supposed value. The management of the works is confused; the planting of oak and fruit trees being introduced in the very middle of a book on arable lands. The grains are separately discussed in the management and value, and the following estimate is given of beans:—

Rent of an acre of land in one year.	£0 12 0
Ploughing once, straining in the beans, and harrowing	0 7 6
Seed four bushels	0 8 0
Mowing and cocking an acre of them	0 5 0
Carrying four loads out of the field	0 6 0
Thrashing and cleaning thirty bushels of beans	0 5 0
Taxes and tythe	0 4 0
	<hr/>
	£2 7 6

Whereof received for 30 bushels of wheat	£2 14 0
For straw and chaff	1 0 0
	<hr/>
	£3 14 0

Profit . . . £1 6 6

Oats yield a profit of £1 1s.; and in the year 1732, quoted by the author, wheat cost 10s. 9d., and barley 3s. 6d. on an acre. The artificial grasses are white and red clovers; sainfoin, lucern, ryegrass, and cowgrass. The latter plant means the cowgrass, or *Trifolium medicum* of botany. The manures are well described; but no new substance is added to former lists, only hoofs come very near to the knowledge of bones. Of lime the author thinks that calcination sets free and enables to act a balsamic alkaline salt that is coagulated in the crude stone or chalk, and till the acid barren quality is evaporated by fire, the salts in them are of little or no signification to the land. Fire, fermentation, and putrefaction cure the dead quality and bring out the dormant powers. Lime is used in three ways—by mixing it with turf or mould, by being sown over the ground when pulverized, and over the ground with turnip seed, on a clover ley sometime previous to being ploughed. He thinks hot lime kills the small animals of the soil, and that it must benefit lands of every kind in some degree. Chalk is reckoned an excellent alterative, and corrects every kind of acidity.

"The Practical Farmer, or the Hertfordshire Husbandman," is of 223 pages of small octavo size. It has gone through five editions. It treats the meliorating of soils, the grains, grasses, cows, sheep, and suckling of calves; pigeons and rabbits; forest trees; manures, hops, foreign wheats; comparison of different methods of farming. The author recommends horse-hoeing of peas and beans, and burnt clay as a manure, and seems fully aware of the vast benefit to light lands from consuming the turnips on the ground by sheep. Cows pay £4 a-year clear profit by suckling fat calves, or from butter and cheese, and last for ten years. The diseases are treated and cured. The author reckons sheep the most eligible of all animals, and where they are not kept a farmer's destiny may easily be read. The rot is the great misfortune, and is caused by water, and grows. It is cured by salt and dry food. Fruit trees are not forgotten for the farmer's use, and the making of cyder and perry. Manures are mentioned, but not at much length, and hops are noticed; the comparison of the farming of different counties; states the practices of use, but does not enter into the merits of preference.

"The Modern Husbandman" is an octavo of 21 chapters, which describe the sowing of grains, turnips, use of manures, wheel-carriages, and the artificial grasses. This work came out periodically, and was completed in 1744, in eight volumes, 8vo., price £2 2s. It was subsequently abridged, and much reduced in price. The volume above quoted seems designed for the beginning of the year.

"The Timber Tree Improved" occupies 110 8vo. pages, and is bound with other tracts into a volume of good size. The different trees of timber and fruit are separately considered, and the value duly estimated. The proper soil for each kind of vegetable is accurately ascertained, and the management discussed.

"New Experiments in Husbandry" for the month of April occupies 124 octavo pages, and is bound with the last mentioned work. It treats several processes of ploughing; the transcendent uses of the late-invented Hertfordshire double-plough; improvements of grain, grasses, manures, and trees; prevention and cure of rotten sheep, also of the red-water and foot-rot; keeping of hogs, cows, and horses from diseases; the bites of jockeys exposed; of pickling pork, and the proper vessels to keep it in. The breeding of fowls, and new invented rowl. Letters and answers concerning husbandry, with other beneficial matters tending to the improvement of this most useful science.

"A Complete System of Experienced Improvements made on sheep, grass lambs, and house lambs, or the country gentleman's, the grazier's, the sheep dealer's, and the shepherd's true guide in the most profitable management of these most serviceable creatures," is an octavo volume of 383 pages, showing how the best of sheep may be bred, how to preserve them from surfeits, scabs, wood-evil, white and red-water, the rot, and other distempers. How to cure sheep when wounded or diseased, so that there may be no loss in that way. How to preserve sheep from hoving or surfeiting, and to promote their fattening. How to make ewes take the ram at any time of the year. How to secure lambs from being killed by foxes. How to convert fallen sheep into profit. How to teach dogs for the shepherd's use. Many impositions exposed relative to sheep and lambs. The newest method of suckling house lambs in the highest perfection.

The author reckons a lame shepherd and a lazy dog the best attendants on a flock of sheep; because they drive the animals leisurely, give the due time for feeding in the places where the best living is found. This conclusion approaches the opinion that in enclosed countries which maintain heavy sheep, the shepherd should be without a dog, or the beast must be severely broken into discipline. The kinds and qualities of dogs are described at length, and the following verses on a dog conclude the chapter:—

The dog among the quadrupeds  
For sport and faithfulness exceeds  
All other beasts. He best attends  
His master's call, his horse defends;  
And tho' he's driven away with spurns,  
With wagging tail he still returns.

When you his excellence display,  
He's sensible of what you say,  
And in dumb show his thanks does pay.  
He swims where'er you take the ford.  
Where'er you sail he goes on board.  
With you o'er rugged Alps he goes,  
And guards you through a crowd of foes.  
Still all the day he keeps in view,  
Nor is he in the dark less true,  
He loves not him that loves not you.  
Through all the windings of the wood  
He toils to make your pastime good—  
Runs down for you the nimble hare,  
And it, untore, in's month doth bear—  
Pursues all game through bush and brake,  
Not for himself, but for your sake.  
When you repose he couches by,  
Or bears his chain contentedly—  
Your houses, and your poultry guards,  
Drives thieves and foxes from your yards—  
In sleep secures your household store,  
He drives all treachery from your door.—  
He asks no dainty bit or cup  
Profuse to keep his spirits up;  
Content your dirty plate to lick,  
A crust to gnaw, or bone to pick.—  
Who would not such servants please?  
Who would not love and harbour these?

In this volume the author enlarges on the great value of turnips to the sheep farmer, and thinks it the most valuable plant yet known in agriculture. He describes well the drawing of the best store sheep after harvest to be fattened on turnips, and calls the cultivator of ground an "afternoon farmer," who does not grow large breadths of turnips and rape for the use of the sheep flocks. The feeding of turnips by handling the animals on the ground, was as well done then as now, and is most correctly described. The folding of sheep on the summer culture of lands is much recommended, and to be done by the store flocks. The suckling of fat lambs is amply described; the artificial foods to be given in troughs, as meals, pollards, and powdered chalks—the diseases and cures are not neglected, and the volume concludes with a notice of wool and the shearing of sheep; the value of skins, hoofs, and horns.

As Bradley's work was the first publication on the animals of the farm, so this first work of Ellis's is the first book in the agricultural world on the subject of sheep, which it treats exclusively. It shows large knowledge of the subject in every detail, and a very useful mode of conveying the information. The works of Ellis are differently stated in every list of authors that has been compiled; no two catalogues give them a like, and use the same titles or dates. Our list of the whole works by the author is taken from the "Bibliotheca Britannica," and the books noticed and described were found in the British Museum. It is curious that the last

mentioned work "on sheep" is not found in any but of Ellis's works, not even the "Bibliotheca Britannica—our research found it in George the Fourth's library in the British Museum. It is probably the most valuable of all the author's works.

Ellis was not the author of any originality on the subject of agriculture, nor did he write any conception that merited that appellation. But he was a large promoter of the art both by precept and example, and consequently occupies a niche of no low standing in the temple of agricultural fame.

LXXXIV.—ROWE, 1734.

Jacob Rowe, Esq., Gent., wrote, "All Sorts of Wheel-carriages Improved, with cuts," London, 1734, 4to., price 1s. This essay occupies 38 quarto pages, and is illustrated with copperplates of wheels and axles. To cancel friction, the author says that the axle must revolve with the wheels, and the axis must not touch any part of the bottom of the machine during the turnings. He seems to have adopted the idea of low wheels of two feet in diameter, and without any cylindrical concavity, as is now used.

LXXXV.—PHILLIPS, 1735.

Robert Phillips wrote "Dissertation concerning the Present State of the High-roads of England—especially those near London—wherein is proposed a new method of repairing and maintaining them." London, 8vo. This essay occupies 62 pages of small octavo, and is embellished with many cuts of the formation of the centres of roads, sides, ditches. It was read before the Royal Society and much approved. The author recommends to screen the earth from gravels, and to make dry the beds of roads; to make deep side ditches, and keep them in clear running order.

LXXXVI.—THOMSON, 1735.

Weston states George Thomson to be the author of an account of a thrashing-machine invented at Dalkeith in Scotland, which in a minute gives 1320 strokes, as many as 33 men. It goes while a water-mill is grinding, but may be turned with wind or horse.

Our research altogether failed to obtain any notice of this work, or even of the author, in any catalogue of books or lists of authors, except the above noticed by Weston, who ascribes to the same author "Short Method of Discovering the Virtues of Plants." It is known that the first idea of a thrashing-mill in Scotland conceived the notion of a number of flails, and that sometime elapsed before the cylinder with scutchers and rollers found way into use, or even into an ideal existence; and curiosity would have been much gratified by a pe-

rusal of this early notice of an implement in which Scotland can justly claim the whole originality.

LXXXVII.—MOORE, 1735.

John Moore wrote "Columbarium, or the pigeon-house, being an introduction to a natural history of tame pigeons," London, 1735, 8vo. The essay occupies 60 pages octavo, and gives an account of the several species known in England, with the method of breeding them, their distempers and cures. The author had been an educated person, both from the language he employs and the practical directions on every point of detail. The pigeon-house is very correctly explained, the food for the animals, their usefulness, and the value of their dung. It is a valuable work of the kind.

LXXXVIII.—BRACKEN, 1735.

Henry Bracken, M.D., wrote several works on farming, which were esteemed, and passed through several editions. Weston ascribes to him "Gentleman and Farmer's Guide," 8vo., price 1s. 6d. The books on farming are found in the British Museum, and are printed with the author's name in the "Bibliotheca Britannica—but no notice is made of Weston's "Farmers' Guide" which rests on his sole authority.

LXXXIX.—TROWEL, 1739.

Samuel Trowel, gent., wrote "Treatise of Husbandry and Gardening," London, 1739, 8vo., and in German at Leipsig in 1750. It is a plain and practical method of improving all sorts of meadow, pasture, and arable land, &c., and making them produce greater crops of all kinds, and at much less than the present expence.

Under the following heads;—

1. Of wheat, rye, oats, barley, peas, beans, and all other sorts of grain.
2. Turnips, carrots, buck-wheat, clover, hemp, rape, flax, and colesseed, &c.
3. Weld or woad, woad or wade, madder, saffron, &c.
4. Meadow, pasture grounds, and the different manner of feeding cattle, and making other improvements agreeable to the soil of the several counties in Great Britain.
5. Hops, forest and fruit trees, vine and garden fruits of all sorts.
6. All kinds of flowers, shrubs in general, and green-house plants.
7. A curious scheme of a farm, the annual expence of it, and its produce.

With many new, useful, and curious improvements never before published. The whole founded on many years' experience.

The book is a thin octavo of 164 pages, in a

well-arranged and concise order. No mention is made of manures, except of an artificial mixture which has no name put to it, and a manure liquor for soaking grains to be sown. The author has not risen above joining with agriculture the description of fruits; which continues the evidence that the forest yielded the food of man before the grains were known, and therefore formed a long standing consideration. It required a time beyond the date of our notice to separate the herbs and fruits into special departments.

Trowel may have been of the legal profession, as his work is dedicated to the Treasurer and Masters of the Inner Temple, to whom he had acted as steward. He shows himself to have been an educated person, and had travelled much over the kingdom. The annual expence of a farm of 180 acres of arable land, and 20 acres of meadow and pasture, let at £100 per annum, is calculated to amount to £567 1s. 3d., and the produce to £910, eaving for clear profit the sum of £342 18s. 9d. Five quarters per acre is stated as the produce of wheat, barley, oats, beans, and peas.

Educated amateurs are more deficient in practical calculations than on theoretical conceptions. The former too often overturn the stability of the latter, and throw a discredit on the most plausible entertainments. Practice with all its dogmas is ever required to guide and sober down the flights of ideal states of existence.

#### XC.—MURRAY, 1740.

The "Bibliotheca Britannica" states that Sir Alexander Murray, of Stanhope, Bart., wrote "True Interest of great Britain, Ireland, and our Plantations, or a proposal for making such a union between Great Britain and Ireland, and all our plantations, as that already made between Scotland and England." To which is added "A New Method of Husbandry, by greater or lesser canals in Scotland; also a letter and remonstrance to Lord Hardwicke, on the miserable state of Scotland," London, 1740, folio. This work is nowhere else noticed, either in a list of authors or of books, so that nothing can be known how, or by what means it was proposed to introduce a new husbandry by canals, or what were the very particular modes of proceeding. It is always pleasant to know the ideas of men, and when no result follows the inspiration must be allowed the consideration of reality.

#### XC1.—BLACKWELL, 1741.

Alexander Blackwell, M.D., was a native of Aberdeenshire. He studied physic at Leyden, under Boerhaave, took the degree of M.D., practised as physician at Aberdeen, and afterwards in London; but meeting with no success turned printer, and was bankrupt in 1738. About 1740 he went to

Sweden, became projector, and laid a scheme before His Swedish Majesty for draining the fens and marshes. He was suspected of being concerned in a plot with Count Tesin, and was beheaded in August, 1748. His wife Elizabeth was the author of a curious herbal. Blackwell wrote "A New Method of Improving Cold, Wet, and Barren Lands, especially of Clayey Grounds," in 8vo. The book was printed in Swedish, at Stockholme in 1746, in 12 mo.

This author is noticed, as has been now related, by London in his Catalogue of British Authors on Agriculture, and also by Weston; the "Bibliotheca Britannica" does not print his name, and the libraries of the British Museum do not possess the book. Both the last mentioned repositories contain the "Herbal," published by Mrs. Elizabeth Blackwell, and totally omit the husband's name. The work of Blackwell may not have acquired any degree of notoriety.

#### XCII.—ROBINSON, 1744.

James Robinson is stated by the "Bibliotheca Britannica" to have written "Harleian Miscellany, seu collectoriariorum tractatum," London, 1744, 8vo. These consist of several articles on agriculture and botany. The names are not found in any other collection of writers or titles, and the work does not appear in any library.

#### XCIII.—WICKHAM, 1755.

The "Bibliotheca Britannica" prints Moses Wickham, of Hatfield, in the county of Hertford, as the author of "The Utility and Advantages of Broad High Wheels demonstrated rationally and mathematically, so far as to be understood by the meanest capacity," London, 1755, 8vo. No other notice occurs of this author, or the work on wheels, except by Weston.

#### XCIV.—LISLE, 1756.

Edward Lisle, Esq., of Crux Easton, in Hampshire, was the author of "Observations on Husbandry," 4to., price 18s. The work was published from the author's manuscript by his son Thomas Lisle, D.D., and a second edition followed in two volumes, 8vo., price 10s. The book forms a quarto volume of 450 pages, and treats arable land; manure and manuring; plough and cart tackle; ploughing; harrowing; picking up stones; sowing; rolling; corn in general; wheat, rye, barley, oats, buckwheat, beans, peas, vetches; reaping and mowing; raking; carrying of corn; thrashing; reeks; granaries; thatching; malt and malting; hops; grazing; foddering; fattening of cattle; turnips; grasses; meadows; pastures; downs; bulls and oxen, cows and calves; diseases in cows and calves; the dairy sheep and lambs; of shearing sheep, of folding sheep, of feeding and fattening

sheep; diseases in sheep and lambs; horses, asses, and mules; wood; fences; orchard, and fruit garden; kitchen garden; weeds; water and watering; workmen and work; of the farm-yard; hogs, poultry, pigeons, bees; hay; wool; hides; rise and fall of markets and their causes; weather; enemies to husbandry.

Lisle's book has ever been very deservedly esteemed—his enquiries had been very extensive, and the observations and deductions are acute and very honest. Turnips were well known to the author, and the broadcast raising of the crop of plants is most accurately described; the over cropping of lands after being limed, and pared, and burned, is well understood, and to be avoided. A complete body of husbandry is not pretended; some things are slightly touched upon, and some others, as hemp and flax, are not mentioned at all—and many other useful observations might no doubt have been added; for, as Mr. Lisle as observed, "the variety of the subject is never to be exhausted." Every day produces new inventions and improvements in agriculture—perfection is unattainable—and every candid tiller of the soil must acknowledge a deficiency in some particulars relating to his profession. The author's son, who published the work, gave it to the world as he was able to copy the manuscript, and hoped it would assist those who were already practitioners; show them the opinions of others in doubtful and disputed cases, and the usages of distant counties of the kingdom; encourage them to make trials—caution them against many errors, and often save them much labour and expence, by communicating experiments already made to their hands. He regrets that his father did not live to revise and put into form the observations he had made, as they would have become much more acceptable to the public than could be done by his own professional ignorance. The advertisement is dated from Bursclere, Hants, Sept. 1st, 1756, Thomas Lisle.

The book is embellished with a portrait of the author as a frontispiece, and is certainly a fine engraving, showing the breast and face, in the loose mantle and large flowing wig of those days, in a style fitted for the bench of any judicial court. Lisle was a very superior person, and promoted the art of agriculture, though he did not originate any thing wholly new, or devise any better mode of executing the old performances. He collected the best ways, and put them forth to be imitated.

#### XCV.—SHELDRAKE, 1756.

Weston ascribes to —— Sheldrake, M.D., "A Treatise on Welch Farming," price 1s. It appears that this author was a scientific surgeon of Westminster, and that the name and authorship extended

from father to son. The professional works are printed in the "Bibliotheca Britannica," and are found in the British Museum—but no notice is any where made of the treatise on farming, which rests on the sole authority of Weston.

#### XCVI.—HILL, 1757.

Weston ascribes to John Hill, M.D., "A Complete Body of Husbandry," with copperplates, in folio, price £1 11s. 6d. This work is nowhere found in attachment with the name of Sir John Hill, who must be supposed to be the author mentioned by Weston.

He was born about the year 1716, and after serving as an apothecary, failed in London in that profession. From it he caught a relish for botany, and studied, and published on that natural science. He was much noticed and recommended, and wrote largely on different subjects, on natural history, essays, articles, novels, and romances. He had superior talents, but was not very happy in the application of them. It is unrecorded how he arrived at the honour of knighthood.

In connection with our special purpose, Sir John Hill published "Eden, or a Complete Body of Gardening, 60 plates coloured," London, folio, "The Gardener's New Calendar," with plates, London. "An Idea of a Botanical Garden in England." "The Sleep of Plants, and cause of motion in the sensitive plant explained." "The Gardener's Pocket-book, or country gentleman's recreation, being the kitchen, fruit, and flower garden displayed. Hill died in 1775.

The list of the works of this author occupy nearly a column and half of the very small type of the "Bibliotheca Britannica," but among them is not found the work on husbandry, and the libraries of the British Museum do not possess it. Here has been seen a large folio work of two volumes, with many plates of the date of our notice, and without any author's name attached, called "A Complete Body of Husbandry." To this book Weston may have fixed the name of Sir John Hill without any authority, and probably with some assumed supposition that prevailed in his time. Subsequent quotations may have been copied from Weston, in the same way he forms our authority for the above notice.

#### XCVII.—CLARIDGE, 1757.

This person published "The Country Calendar, or the Shepherd of Banbury's rules to know of the change of the weather." This work is in octavo, and occupies 64 pages of twenty-six chapters or divisions, each of which states a mark or sign of prognostication. The statements are said to be grounded on forty years' experience, and were much

reputed at the time of publication. The following old sayings are used in the work itself:—

Janiver freeze the pot by the fire.

If the grass grows in Janiveer,  
It grows the worst for't all the year.

The Welchman had rather see his dam on the bier.  
Than to see a fair Februeer.

March wind and May sun  
Makes clothes white and maids dun.

When April blows his horn,  
It's good both for hay and corn.

An April flood  
Carries away the frog and her brood.

A cold May and a windy  
Makes a full barn and a findy.

A May flood never did good.

A swarm of bees in May  
Is worth a load of hay.

But a swarm in July  
Is not worth a fly, &c., &c.

Our author inserts this name in compliance with other lists of authors, though the work is very trifling. Weston does not print it in his catalogue of authors, but the name appears in Loudon's list, and the book is found in the British Museum.

#### XCVIII.—HOME, 1757.

Francis Home, M.D., was Professor of *Materia Medica* in the University of Edinburgh. He wrote "The Principles of Agriculture and Vegetation," being a prize essay, written for a society in Edinburgh, established for the encouragement of arts and manufactures. The book is a thin octavo of 179 pages, divided into five parts of sectional portions. The plan of the whole is subjoined, as it is the first regular attempt to put agriculture on scientific grounds.

##### PART 1.

- Sect. 1. Causes of the slow progress of agriculture, connection of chemistry with it, and division of the subject.
2. Of different soils.
  3. Of the rich black soil.
  4. Of the clay soil.
  5. Of the sandy soil.
  6. Of the chalky soil.
  7. Of till.
  8. Of the mossy soil.

##### PART 2.

1. The natural method of providing vegetable food.
2. Of manures, or the artificial method of providing vegetable food.
3. Of marl.
4. Of unburnt calcareous bodies, and quicklime.

5. Of vegetables in an entire and in a corrupted state, and of dung-hills.
6. Of manures from burning vegetables.
7. Of animal manures.

##### PART 3.

1. The effect of different substances with regard to vegetation.
2. Of the food of vegetables.

##### PART 4.

1. Of opening and pulverizing the
2. Effects of the atmosphere.
3. Change of species.
4. Of ploughing.
5. Of composts.
6. Of vegetation.

##### PART 5.

1. Of weeds.
2. Of a wet soil.
3. Of rains.
4. Of poultry seeds.
5. Of diseases of plants.
6. Plan for the further improvement of agriculture.

The knowledge of this book is of a high order, and conveyed in language that shows the educated scholar. The time now appeared when any single subject was not being clogged with extraneous matters, which most completely bewilder the writers of early times, and buried the subject almost beyond being at all discovered. But in this work the intended subject is never dropped, nor any irrelevant matter introduced. The sections are short, pithy, and concise, and the work is not exceeded by any similar publication of the present day. In order to promote agriculture the author proposes a larger spirit of experiment making over the country, to be communicated in the results by means of the appointed channels. Agriculture must proceed upon facts and experience—reason has not much to do with it, but chance and design have the chief influence. The author adopts the common opinion of the action of quicklime, that it dissolves animal and vegetable substances, and converts them into mucilaginous matters. He very judiciously advises lime and farm-yard dung to be applied to the land at the same time, but not in mixture. Home's book must have been a valuable production at that early time, and is such at any time.

#### XCIX—MAXWELL, 1757.

Robert Maxwell, of Arkland, wrote "The Practical Husbandman, being a collection of miscellaneous papers on husbandry, &c., dedicated to the Right Hon. William Pitt, Esq." Much information is conveyed in the letters of enquiry, and the an-

swers thereto, by the leading improvers in Scotland, where the spirit began to move about this time. The volume contains 432 pages, and there is figured the Rotherham plough, as constructed by Lummis, the first maker of that implement. The beam is straight and the handles short.

## ON THE ADVANTAGES OF PORTABLE FARM BUILDINGS,

SUGGESTED AS A REMEDY, IN SOME DEGREE, FOR THE SCARCITY OF FARM LABOURERS.

BY BARUGH ALMACK.

1. On the 24th of July, 1852, a friend wrote for my opinion as to the best plan for a complete set of new farm buildings; and, as I had reason to suppose that they were to be erected on a farm not yet enclosed, or in any manner fettered by roads or other artificial works, it seemed that, as these would be unusual circumstances, the more caution was necessary to begin in a right manner, because if the best plan was not adopted there would not be the usual and unanswerable excuse of old buildings being in the way.

2. It seemed obvious that, as the general fault of old plans was that they did not leave space for adopting all subsequent improvements, it would be desirable to discover, if possible, some new plan that would *expand* and adapt itself to circumstances, so as to admit of future improvements, as well as include all those known when the buildings were first erected.

3. Each building should be, not only the right thing in itself, so far as knowledge in such matters has advanced, but also so contrived, if possible, that it may be, on each occasion for using it, in the very best place on the farm for economising labour, and whatever else is valuable, so as to obtain the largest value in produce at the smallest cost.

4. Knowing that some of the best plans hitherto produced have obvious faults of position, when tried by this economical test, and believing it to be almost impossible to fix a whole set of buildings so as to prevent the chance of this being proved by experience, or by improvements in the mode of carrying out agricultural operations, I was forced to the conclusion that to make the buildings *portable*, or removeable from one part of a farm to another, would be one of the most likely means, if not the only means, whereby to correct errors of position, and to give room for expanding or contracting the general plan as circumstances might prove to be necessary.

5. I have known cases in which it was clearly proved that some of the best farm machinery was worse than useless (leaving the cost of the machinery itself out of the question), because more extra expense was incurred by bringing the farm produce to and taking it from the machinery than the value

of the work done by the use of the machinery; but if this machinery had been "portable," it could have been applied with decided advantage.

6. Thus it appears that the word *portable* expresses a very important quality; and as Mr. Thompson, one of our Implement Stewards, has very properly intimated a wish to diminish the use of the word "impossible," perhaps I may be allowed to suggest that it is very desirable to draw general attention to the importance of the word "portable," as without it I do not see how we can have the right buildings and the right implements in the best places for general use.

7. If necessary, every building on a farm might be made so as to be "portable;" therefore, the chief question will be—What is likely to prove beneficial under the circumstances of any particular case? And to decide that question, all the circumstances of the farm must not only be known, but have due consideration, as what might pay in some situations would not in others.

8. It may be said, with truth, that portable farm buildings would be more generally beneficial in the colonies, or in other countries where the land is at present unenclosed and in its natural state; but the same remark would apply more or less to almost every other agricultural improvement, and particularly to all such as relate to railways, tramways, trucks, carriages, and modes of conveyance generally; but as some of the inhabitants of other countries are likely to adopt real improvements whether we do or not, that is a reason why we should apply them so far as they are likely to be beneficial under our circumstances, but no further.

9. In a case where all was to commence, that is, where there were no roads, fences, gates, ponds, nor buildings, it might, but *I do not say it always would*, be desirable to have all the buildings moveable.

10. Where the reverse of all this was the case, and the farms were also small and compact, probably there would generally be so much less necessity for moveable buildings.

11. Where the farms were large, and the land scattered, or far from the present buildings, it

might be good economy to have new and portable buildings for the outlying fields.

12. In no case should present buildings be pulled down hastily, especially if they are in good repair, and likely to cost little by remaining where they are.

13. In short, I wish it to be clearly understood that I do not advocate rash and costly changes, or any changes that after due consideration are not likely to be profitable.

14. When new buildings are intended, I would suggest for consideration whether any of the new buildings, or any portion of each building, should be made so as to be "portable."

15. The Crystal Palace of 1851 was a practical proof that in some cases it may be well to make parts of a building in some degree moveable, so as to make the materials useful for different purposes.

16. If any one doubts the value of having farm buildings moveable, let him bear in mind what a saving of labour there would be, in some cases, by having portable cattle-boxes, &c., to take to one end of the farm, instead of bringing the turnips and straw, &c., from that end of the farm, and then taking them back again as manure.

17. Unnecessary labour causes other labour that would not otherwise be necessary; for instance, unnecessary carting on roads causes labour in repairing them.

18. By avoiding the first error, and consuming the produce, or part of it, near to where it was grown, the number of operations saved would vary according to circumstances, so I will not attempt to enumerate them; but in some cases the saving in the cost of labour, and in the quality of the corn by harvesting it more rapidly, might be equal to the whole rent of the land.

19. It may be said that, to do this, the cattle and their "boxes," &c., would want a labourer to look after them; and "where would he live?"

20. My answer is—Why should not he live in a portable cottage close by his work, if that would pay the landowner and occupier the best as a means of enabling them to cultivate the land?

21. When 1,000 men can live in a portable building at sea, surely a labourer, and his wife if necessary, may be provided with a portable residence on land that would contain more comforts and conveniences than they are accustomed to.

22. If horses had portable stables close by their work, they would lose less time in going to and from it, therefore they would be able to do more real and necessary work in the same time.

23. They could be comfortable in the stable close by, when not wanted on the land, and what is more, they could be making the best manure by eating a

green-crop of lucern, tares, or whatever else was most likely to be profitable to grow close by, and the manure so made would be close by where it was wanted.

24. Besides all the numerous advantages which might be derived from having healthy horses in portable stables, it should be borne in mind that, if illness attacked any of them, it would be very important to be able to move the sick stable and horses from the rest.

25. This last consideration would apply more or less to all sorts of stock; and although I have only gone into some details respecting cattle and horses, those who reflect on the subject will generally agree that in some cases portable buildings would be desirable for every kind of stock that is common on English farms.

26. I have no doubt it is quite practicable to make every necessary farm building moveable, and in many cases I am quite certain that it would pay well to make part of them portable, especially now that there is a probability of an increasing scarcity of farm labourers—which proves how important it is to employ such as there are on labour that is really necessary and profitable.

27. It always was important, and it is now becoming quite essential, that time and labour should be applied to their best purposes; therefore the manager of a large farm should act somewhat like a skilful player at chess, who makes no false moves either to or from any part of his board.

28. When the produce of the farm is unnecessarily carted a considerable distance to the buildings, so as to incur the otherwise unnecessary trouble of bringing manure a great distance to supply its place, the first was surely a false move.

29. The move, although clearly a bad one, is yet very common on some farms.

30. The remedy, to a certain extent, may be obtained by giving due importance to the word "portable."

31. If "portable" farm buildings saved the labour of men, they would also save the work of about twice as many horses; and thus the question becomes one of great importance to the community at large as well as to individuals.

32. These thoughts occurred to me within a day or two of receiving the letter referred to above, but until very recently I have not felt at liberty to draw general attention to them.

33. I am not aware that any one has previously suggested the trial of "portable" farm buildings, and I am prepared to receive the usual proportion of ridicule as a proposer of a new plan; but I wish to submit it to the fair consideration of all persons who take an interest in such subjects, and I am



more particularly desirous of drawing the attention of agricultural implement makers to the idea that, if some farm buildings, such as cattle boxes, were made "portable," they would afford to them another source of profitable employment for their

capital and skill, and a means of being useful to others to an almost unlimited extent.

34. Perhaps it is scarcely necessary to state that there are *several* modes by which farm buildings could be made "portable."

### ON MANURING CROPS.

Perhaps there are few phases of agricultural skill which require more judgment, or which are more difficult to manage, than the application of sound and known principles to specific cases. Many a man knows the great outlines of the soundest principles of farming, but is quite at a loss when and where, or how to apply them in detail. Within a certain range he may have a vast mass of selection, and he may be unable to determine what course of cropping, what manure, or what mode of cultivation to adopt, so as to pay the best for the present, and act the most successfully for the future. To ascertain this is always a very important matter in the agriculturists' opinion, and much gain or loss may take place through a very slight deviation from what may be the proper and practical course.

We are always most ready to assist with our advice any party who, being supplied well with discrimination himself, furnishes us with facts on which to give him an opinion, based on practice as well as on scientific research: and as a specimen we copy a letter we have lately received from the sister island—just a case in point with the one we have supposed. The writer has given us the history of the cropping of his land, and some information of the nature of the soil and subsoil; and it will be seen that a very scourging system of cropping had been previously adopted, and that the soil itself is not very first-rate. Two questions arise: which will be the most successful mode of securing lasting fertility? and which will ensure the most profitable return in the time intervening? They are both important questions.

CASCADE GARDEN, DURROW, IRELAND, November 8th, 1852.—I have got a field of 6 acres, with a southern aspect, very strong stiff soil (such as in this country is termed good wheat land), and a yellow clay bottom. It had been for five years in grass, up to the harvest of 1849, when it was ploughed in setts, well coated with good short dung (which I procured cheap from a person living near, for it is too great a distance to think of drawing dung there from my farm-yard), wheat harrowed in, and the furrows shovelled. From this I cut an excellent crop of wheat in the harvest of 1850. I again sowed wheat on the following year, and had a good crop in the harvest of 1851; and on last year I sowed oats which were a fair crop. I am now ploughing the oats stubble, and am anxious to let out the field, and would wish to manure it before so doing, but such a chance of

obtaining dung as I met before may never occur again: I must try lime or guano. The cost of 6 cwt. of guano, which is the complement I propose, per acre would be, at 11s. per cwt., £3 6s. Lime would stand me in *exactly the same amount*. If I lime, I shall have to summer fallow, take a crop of wheat, and let out with a spring crop the year following (for grass seeds never take in a winter crop in this land). By this means my field is a year idle, and I am relying on a wheat crop to pay two years' rent—a very doubtful thing these times. I would prefer to sow a crop of turnips next spring, applying 6 cwt. of guano per acre, and let out with a spring crop the year following, if I thought the land would be in good heart to do so; for some assure me that guano is of no avail after the turnip crop—that it gives but the turnips, and is of no use to the spring crop or grass. Others, again, assert that 6 cwt. of guano is as good for all purposes as any dung; and that, by giving that complement per acre, I will have my land in good heart to let out, with an oat crop the spring after I remove the turnips, and that the grass after will be good also. As I have never tried guano, you will much oblige me by giving me your opinion on this subject, with such advice as you think fit under the circumstances. —McIVOR.

The question Mr. McIvor wants solving is this: Which is preferable—to give a good coat of lime, with a summer fallow, and sow wheat? or a good dressing of guano, and sow turnips? the one involving two years' operations, the other only one, and all having an eye to present *pay* and to future condition. Now we must bear in mind that the soil has been three times corn cropped: all has gone off except one dressing of manure. For corn it is manifestly impoverished; and what, under the circumstances, will lime do for the soil? The fallow will clean it; for it must, after three corn crops, be somewhat foul; the summer action of sun and air and water will disintegrate some of the inorganic materials locked up in the particles of granitic rock which the clay drift may be most likely to contain; and the addition of lime will supply a quantity more of mineral matter, and tend to render active the vegetable matter which may be inert in the soil. But is it likely there may be much of this? We think not. There can be no very great quantity beyond the roots of the corn crops, and possibly the stubble, and this will not be anything but easily dissolved and active. Hence lime appears hardly what the soil requires under

the circumstances: we should not expect from its application any large produce of wheat—and yet a large produce ought to be obtained, to pay for the labour, outlay, and deferred letting.

Take the other alternative. The preparation for turnips would also clear the soil of weeds, while the after-hoings would complete that operation. Then the guano would supply all the elements of a vigorous crop of turnips. It would do more: it would be questionable to us if 6 cwt. per acre is not an over-dose at one time, even to this very exhausted land. But the Irish acre may be here intended, though not expressed; so that the 6 acres may be 10 statute acres, and the application of 36 cwt. of guano less than 4 cwt. per acre. If it is not so, it were best to apply 4 to the turnips, and 2 to the following crop of oats. Now the guano will supply all the elements the soil wants, and more—will supply them in a state fit for immediate assimilation. Hence we quite prefer the guano application.

It is a delusion to imagine that a dressing of nearly four cwt. of guano per acre can be carried off by any one crop, much less a crop of turnips. The experiment made by the Duke of Somerset to test the comparative durability of guano and lime, both mixed with equal quantities of pond mud, and spread over three years, with but one application, was most decisive, and is a case in point for our correspondent: only it applied to grass, a circumstance not material as far as the general principle of *duration* is concerned. On lot No. 1 he applied six cubic yards of mud, mixed with  $1\frac{1}{2}$  hogsheads of lime, in 1847. The produce was—

1847.....	353	lbs.
1848.....	337	„
1849.....	538	„

Total in three years. . 1,228 „

To No. 2 he applied 6 cubic yards of mud, with 90 lbs. of Peruvian guano, in the same year. The result was—

1847.....	930	lbs.
1848.....	550	„
1849.....	725	„

Total in three years. . 2,205 „

or upwards of ninety per cent. advantage.

But it was not only that he had more gross produce by nearly double—he had more every year; and the third year of the guano application had nearly 50 per cent. more produce than the third, the most favourable year for the application of lime. We well know from ample experience that the guano will manifest ample symptoms of advantage, at least for three, but generally for four crops after the application. When it is applied to a green crop the case is by far the strongest.

Sprengel well says, as a deduction from one of his experiments with a soil—“phosphoric acid is the first substance which will require to be supplied;” and if we supply potash and soda along with it and ammonia, “it will be long before we need to add any more lime.”

The guano supplies all these materials, and hence we think there can be no doubt that whether present advantage or future condition of the soil is considered, Mr. McIvor must make turnips on his soil, and apply the Peruvian guano.

## INSECTS INJURIOUS TO THE INTERESTING

The following report of a highly interesting lecture, delivered to the Armagh Natural History Society, by Professor Allman, will be found well worthy the attention of our farming friends:—

The professor first pointed out the distinctive characters of insects—he showed that they all belonged to the great articulate sub-kingdom; that they were provided with antennæ or feelers, had exactly six legs, and were mostly furnished with wings; they breathed by a most elaborate network of curious tubes, which pervaded every portion of their bodies; and that they underwent a metamorphosis. This metamorphosis is a most striking feature in the economy of insects, and may be easily observed in the moth or butterfly. The parent insect will be seen to deposit her eggs on the plant most suited to afford food to the young progeny; after a variable time these eggs are hatched,

## CROPS OF AGRICULTURISTS. TO FARMERS.

and there proceeds from each a voracious worm or caterpillar. This is called the larva. It immediately begins to eat voraciously and to grow so rapidly as soon to become too large for its distended and overstrained skin, which finally is unable to contain the corpulent body of its owner, and splitting along the back, frees the larva from its restraint; but a new and more capacious skin has been formed beneath the old one, and the larva loses no time in returning to its occupation of eating and growing, till it again becomes too large for its skin, and the old process of moult has to be renewed, and this is generally repeated several times during the lifetime of the larva. After continuing for some time in the condition of larva, it all at once ceases to eat, casts its skin for the last time, and changes into a pupa or chrysalis, which, in the case selected by the professor for illustration, is an oval body,

clothed in a hard dry shell, without any mouth, and totally deprived of the power of locomotion. In this state, plunged apparently in a deep sleep, the insect may remain for an indefinite period. At length, however, the destined moment has arrived, for which all that had previously taken place is only a preparation; the walls of the chrysalis are rent asunder, and there issues forth not a crawling and voracious larva, with an organization chaining it to the ground, but a bright and joyous being, whose empire is the sunbeam and the air, with rapture in all its motions, and hues of beauty on its wings. This is the perfect insect: it lives through a few summer months, deposits its eggs and dies; and from these eggs proceed another progeny, destined to repeat the wondrous cycle of changes.

From the general view thus taken of the structure and metamorphosis of insects, the professor next proceeded to describe the various insects injurious to the crops of agriculturists, and the best remedies for arresting their ravages. Those upon which he more particularly dwelt were the turnip-fly, the black caterpillar, the wireworm, aphides, and the wheat-midge.

#### FIRST.—THE TURNIP-FLY.

This is a little beetle which hops away on being approached, and may easily be known by the thickened thighs of its hind legs, which are so constructed, in order to give room for the powerful muscles, by means of which it is enabled to leap to a distance when alarmed. It is called *haltica* by naturalists, and there are two species of it which attack the turnip crop: the more common one is known by a pair of yellow bands which run down along the length of its back. The other species is destitute of these bands—both appear to be equally destructive.

The professor then proceeded to detail the habits of the turnip-fly. He showed that the parent beetle laid her eggs on the under side of the turnip leaf, chiefly during the summer, and after the leaf had arrived at its rough and fully developed state; that the little larvæ which were hatched from the eggs burrowed into the pulp in the interior of the leaf, and fed on this substance, to the great injury of the leaf. He, however, showed that it was not at this period that the farmer had anything to fear from the turnip-fly, because the turnips were now in their rough leaf, and so strong as to suffer the attacks of the *haltica* with almost entire exception from injury; the larva, however, goes through its various stages and changes—first into a pupa, and then into the perfect beetle. Towards the approach of winter the beetle conceals itself beneath the loose bark of trees, and under stones and fallen

leaves, and in other situations where it may rest secure from the approaching winter. It then hibernates, or falls into a winter sleep; but, on the return of spring, millions of these insects issue from their hiding places, ready the moment the young turnips are above ground with their two little smooth leaves, to fall on them and devour them. It is at this period, therefore, that the farmer has to dread them; and all his efforts must now be directed to arresting the destruction threatened by them to his crop.

The next point considered was the proper means to be employed against the attacks of the turnip-fly. It was shown that, as it was only during the time when the turnips were in their smooth leaves that any harm was to be apprehended, the great object of the farmer should be to force the young plants as rapidly as possible out of the smooth into the rough leaf. This is mainly to be effected by having the land properly prepared—in such a condition, in fact, as experience proves is best adapted to the promotion of a vigorous and healthy vegetation—the employment of hand manure, as guano, put in with the seed, has been found very effective in promoting this vigorous growth; and a most important rule is to sow thickly, and to have all the seed of the same age. By adopting these precautions a luxuriant and healthy vegetation will be sure to take place, and the young plant will be forced beyond all injury from the fly. Lime and soot have been used, but with doubtful effect. Drawing a freshly tarred board over the field has been practised; the fly being disturbed by the board will leap up and stick to the tar, and in this way multitudes of them have been destroyed; but the grand reliance of the farmer must be on thick sowing, and having his land in the best possible condition. If these precautions are not neglected, the farmer need seldom dread the attacks of the turnip-fly.

#### SECOND.—THE BLACK CATERPILLAR.

Fortunately the visits of the black caterpillar are "few and far between;" otherwise, so great are its destructive powers, that the cultivation of the turnip in these islands would probably have to be altogether abandoned. It first appeared in England in 1756, and since then the turnip crops have had frequent visits from it. In 1835 one of the most destructive attacks of this insect on record appears to have occurred. In many cases scarcely a vestige of green remained in the principal turnip counties in England—the crop was altogether a failure. The agent in all this terrible destruction is the larva of a four-winged fly, called *Atharia spinarum* by naturalists. This larva is of a black colour, and about an inch in length. The parent fly deposits her eggs

on the edges of the turnip leaf; from these eggs the young caterpillar comes forth, at first very small, but it grows rapidly, and becomes more and more destructive every day. Unlike the *haltica*, or turnip-fly, it is not alone the young smooth leaves of the plant that fall a victim to its attacks, but the leaves of the full-grown plant.

The black caterpillar has not yet visited Ireland; but when we bear in mind that the cultivation of the turnip to any extent in this country has been comparatively recent, we shall find an explanation of the hitherto impunity, and ought to be prepared against a future attack.

As to the remedies, several have been proposed, such as quick-lime, soot, passing a heavy roller over the field in the evening or night—each of these methods has been partially successful; but the grand reliance must be on hand-picking, or the use of ducks and poultry. A few children may, in a short time, collect 90 or 100,000 caterpillars; and ducks, driven into the infested fields, have been found to save all the turnips committed to their care.

#### THIRD—THE WIREWORM.

The wireworm, unlike the insects already described, does not confine its ravages to a single kind of crop, but almost every crop, either of the field or of the garden, may become its victims. It is a cylindrical worm, of a yellowish colour, marked by very distinct rings, and covered with a hard, horny skin. It is not a perfect insect, but the larva of a beetle called *Elatér*. It lives for five years in the state of larva, becoming more and more destructive all that time, and then changes to an inactive pupa, from which the perfect beetle finally emerges. The perfect beetle, or *elater*, is quite harmless.

Numerous remedies have been proposed against the wireworm. The use of the roller is by some strongly recommended: also, the folding of oxen and sheep in the infested fields. Several chemical applications have also been used, such as lime, soot, and common salt. A curious discovery has been recently made on this subject, namely, that certain plants have the power of expelling the wireworm. These plants are woad and white mustard; and it is found that if a crop of either of these plants be taken from a field infested with the wireworm, this pest will be completely expelled, and the field may be sown with the ordinary crops the following year. Hand-picking is an obvious and most useful mode, and the farmer should be warned to protect rooks, which, though they do a little harm in eating up some of his corn, or rooting out a potato or two, do infinitely more good in destroying wireworms and other injurious insects.

#### FOURTH—APHIDES.

These will attack almost every plant; but the species which the farmer has most to be on his guard against are those which infest his crops of turnips, peas, and beans. An attempt had been made a few years ago to explain the potato disease by referring it to the attacks of a species of aphid, called *Aphis vastator*; but this attempt has quite failed, and Professor Allman stated his belief that no valid explanation had ever yet been offered, and that we are just as much in the dark as ever concerning the cause of this utterly inexplicable affection.

The aphid which attacks the turnips is of a green colour, and is called *Aphis rapæ*. The infested leaves are observed to be curled up and distorted, and the insects may be found in multitudes, sheltering in the folds, towards the end of summer and in autumn.

The aphid which attacks the bean crops is of a sooty black; it is called *Aphis fabæ*; it shows itself first on the tender uppermost shoots of the plant. The aphides multiply to an enormous extent; a single insect may be in one year the progenitor of 100,000,000,000,000,000 of young ones.

The only remedy on which we can rely against the different species of aphid is the removal of the infested leaves; as soon as ever they show themselves they should be carefully carried away and burned.

#### FIFTH—THE WHEAT MIDGE.

A short time before the proper period of ripening, several ears in a field of wheat may be seen to present a yellow and prematurely ripened appearance; on examining these ears, there will be found in each a multitude of little yellow worms lying between the husk and the young grain; they eat up the pollen, and thus prevent the grain ever coming to maturity. The destruction thus caused sometimes amounts to a third of the entire crop. These worms are the larvæ of a small two-winged fly called *Cecidomyia tritici*, which deposits her eggs in the position where the little larvæ are subsequently formed.

It is by no means easy to suggest a remedy against the wheat midge, and perhaps all that can be done is to take care that the pupæ, which are sometimes found in thousands among the corn, in barns, should be separated from the corn and destroyed; this may be easily effected by a wire-gauze sieve placed beneath the winnowing machine.

The insects now described are all injurious to the farmer. The professor next went on to point out certain insects, which, instead of being injurious to the farmer, were his friends; for they were destined by the Creator to keep the others within bounds. These friendly insects chiefly

belong to the tribe of Ichneumons. The ichneumons deposit their eggs in the bodies of the destructive insects, and the latter thus fall victims to them. The beautiful little beetle called the Ladybird, or, as designated by naturalists, *Coccinella*, should also be carefully protected by the farmer, for its larva commits great devastation among the destructive aphides, on which it feeds. Another beautiful insect, called the Lace-wing, or *Chrysopus*, has a larvæ equally destructive to the aphides, and should be taken under the special care of the farmer. Drawings were exhibited of the useful, as well as of the injurious insects, so as to enable the farmer to become acquainted with their

differences, and, by not mistaking one for the other, do harm instead of good in his attempts to save his crops.

The professor then concluded by showing how rich a field for observation was possessed by the farmer, and by impressing on him the importance of omitting no opportunity of turning his facilities of observation to the welfare of himself and of his fellow-men.

The diagrams and pictorial illustrations were remarkably apposite to the lecture, which was heard with marked interest, and hailed with frequent applause by an assembly constituted of the *élite* of the citizens of Armagh.

### THE CULTIVATION OF WHEAT.

We can remember the time when the excitement of obtaining new varieties of wheat was as great as the railway mania, the South-sea bubble, or the still more ridiculous rage for Dutch tulip-roots. New varieties were advertised day after day at prices of the most unreasonable kind, while the puffing proprietors, trusting to the mania and the acknowledged gullibility of John Bull, attributed to their wares qualities the most inconsistent both with themselves and with truth. We remember as the *œmê*, a friend who had caught the mania sent for a ten-shilling parcel of a new variety of great promise, and he obtained twenty-five grains of a most coarse-grained, unpromising kind, costing nearly sixpence per grain—a price per bushel and per acre which we will not take the pains to calculate, as it would only gratify curiosity; but at harvest time, the sample from which so much was promised turned out a miserable specimen; no extraordinary production, but a sort of coarse Sardinian variety, doubtless imported, and much injured in quality by being re-sown in this country.

And yet we believe all this did good. Not that any great amount of absolute good was effected by the introduction of new varieties, but the fact was ascertained that the mere change of seed did good. Those who had never changed a seed—never removed it from a high to a low, a strong to a light, a wet to a dry vicinity, and *vice versa*, got new varieties from Sussex, from Kent, from Norfolk, from Gloucestershire, and from Scotland, for all new kinds were rapidly sought up, even if they had to be found at the antipodes, and were there either approved or not. Most failed. But next year, either from this break of the habit, or from necessity in selling off the kind newly imported, a change of seed of the old kind became a matter no longer of choice. And a good deal was discovered, too, of elasticity and adaptation in the various kinds of newly-introduced wheat to peculiarities of soil and climate. The wheat in

general is unsuited to a light, porous soil. It cannot bear oxygen in any large quantity to its roots. It requires, as a rule, a tenacious soil; and to get wheat to grow at all successfully on a light soil, it had to be "daubed in," or there was but little chance of successful cultivation.

The Spalding wheat can bear the oxygen in a much larger degree than the older cultivated varieties; and hence take a light soil, and sow Spalding and creeping in the same field, and you will find six to eight bushels per acre on such soils more on the one than the other. Again, where spring-sowing of wheat is an object, it is often either too late a season in the month of May, or the frost sets in too early in October to admit of its being fairly matured. Here the April wheat will answer the purpose. It *requires* to be sown in that month to answer at all.

These, however, are special cases, and are by no means in favour of any great inducement to try any variety not usually grown in a district. When an old variety is moderately successful, it is far best to be satisfied with sowing the same kind, only changing the locality, and, if possible, the kind of soil.

Mr. Pawlet, of Beeston, has made some experiments on several kinds of wheat, with a view to test their productiveness, and some other experiments also on other points connected with their cultivation. The latter are of more consequence, we think, than the former. As indicating care and experimental skill, they deserve recording. The trial was made on a poor gravelly loam after clover ley.

The three *white* wheats gave the following results:

Imperial white. . . . .	37 bush. per acre.
Couseus' unrivalled	34 bush. 2 pks. 1 gal. per acre.
Kent brown chaff. . . . .	27 bush. 3 pks. 1 gal. do.

As showing the first kind to be the most remunerative, it sold for 46s. per quarter, and the second only 44s.; and it produced more money per acre than either of the other by upwards of a guinea.

His red wheat trials, made the same day, the whole being sown on the 20th of October, at the rate of 7 pecks per acre, gave the following results:—

Defiance . . . . .	48 bush. 1 gal. per acre.
Golden drop. . . . .	41 bush. 1 gal. do.
Golden goody . . . . .	42 bush. 2 pks. 1 gal. per acre.
Spalding . . . . .	41 bush. 1 pk. do.

Here, again, is a marked difference in the produce per acre. A small area in an experimental piece is of very little value—it absolutely indicates nothing, for the same field, as Sir Vernon Harcourt shows, will vary in a very considerable degree.

The price obtained for the whole was the same, and the maximum difference was 33s. per acre!

In another trial between Browick and Sandon's, two red wheats, the one gave 47 bushels and 1 gallon per acre, the other 44 bushels and 3 pecks; and both kinds sold for the same price, showing a difference of some 11s. per acre.

Now these trials would have been more satisfactory if we had known that any of these kinds had been tried against the kinds ordinarily cultivated in the district, for it is not surprising that a difference as great and even greater would take place between kinds all new to the locality. We quite imagine that if it had been a light gravel instead of a loam, the difference would have been just reversed, and the Spalding turned out far more than any other variety, but have been likely to sell for a less sum per bushel.

We do not think much can be made out by any extensive adoption of new varieties, nor would we venture to go to any length in drawing a conclusion from the experience of one year, or on one soil. The peculiar season of 1851-2 is not by any means to be taken as a test of the general qualities of the different kinds of wheats; and if it were, any experiments at Biggleswade would go no further, with any degree of safety, than to speak in favour of the kind to the locality, even if it were substantiated by next year's trial.

Though the wheat plant has been cultivated for nearly six times two centuries, the whole of the phases of its cultivation are by no means fully understood. In patriarchal times we are informed of one who sowed wheat and obtained in the same year "an hundred fold." One half that quantity, nay, one quarter, may now be said to be a large return. If two bushels of seed be sown and fifty bushels reaped the one is by no means a plentiful seeding nor the other an inferior crop; indeed we may say it is far more seldom arrived at than exceeded.

The discussions on thick and thin seeding have now pretty fully disappeared. Thin seeding for the North of England and for Scotland has been thoroughly exploded; but the questions relating to

the different kinds of sowing, the modes and circumstances of it, are by no means settled.

So long ago as 1850 Mr. Pawlett, of Beeston, near Biggleswade, made some experiments on the hoeing of wheat. He had a portion of land sown with Hessianland wheat on white clover ley, pretty free from weeds, hand-hoed thoroughly, and the remainder left alone. The result, which was carefully marked at harvest time, was as follows:—

	Bushels.	Pecks.	
Wheat hoed produced . . . . .	30	2	per acre.
Wheat unhoed „ . . . . .	28	1	„

In 1851, for the present year, he repeated the experiment. He sowed a piece of land after red clover. The result was very much in the same direction as in the preceding year; but we are sorry he has not given the full advantage of his experiment by stating precisely the kind of soil as to calibre and tenacity. It was as follows:—

	Bushels.	Pecks.	
Wheat well hoed with hand..	42	0	per acre.
Wheat unhoed . . . . .	44	3	„

Making a difference in the one case of nine pecks per acre, and this year of two bushels and three pecks. Now, how could this be accounted for? It seems to set at naught all our previous notions of things. It ignores Jethro Tull and Garrett's horse-hoe—it shows hoeing wheat, in fact, to be absolutely injurious. But let it be well understood: the land was free from weeds; there was no advantage in this respect in the first instance, and this it may be said is a strong reason why it did no good to the land; but how it came to be injurious is another question not so easily solved.

It does not seem to be due to season; for though there was a difference in degree, it was certainly injurious in both cases, and no two seasons are so thoroughly similar as to completely overturn twice over the ordinary and real nature of the operation.

We are obliged to conjecture as to the reason, and we must conjecture only from the fact before mentioned, viz., that we are unacquainted with the nature of the soil—that it must have been some very open and light soil, and that the stirring of it where it did no good only tended to open the land, and so to render the access of oxygen more easy, of which, as we have said, the root of the wheat plant has a direct impatience.

We have no means of getting at the nature of his soil. In a previous experiment he calls it a "gravelly soil," in another a "gravelly loam;" but neither of these quite comes up to our notion of that kind of soil which might be supposed to be injured by opening to the freer access of the air.

We have enough evidence, however, to perceive that it was not much benefited by great consolidation, a state of things which we think must have

been the case had the soil been of a very open character. The same experimenter had two plots selected, which he drilled with white Lammas wheat on a clover ley, one part lightly rolled, and the other rolled three times over with a very heavy roller. The result at harvest was as follows—

Wheat heavily rolled, 38 bush. 2 pecks per acre.

Wheat lightly rolled, 38 bush. 1 peck „

The expense of this operation was very considerable, and the result not at all more than a mere variation of the productive quality of one part of a field over another side by side of it would occasion.

But these facts open out no little of the question how necessary it is to go to first principles, and to begin all our pre-conceived notions with experiments *de novo* as to the modes and principles of wheat sowing. While on the subject of experiments in wheat sowing, on hoeing, and collateral subjects, we cannot help recording Mr. Pawlett's experiments in 1850 as illustrating the difference

between drilling and hand-cast sowing. It turned out, indeed, in favour of drilling, but not to any very great degree, taken with the fact of natural differences which will take place in any field between one part and another. The drilled corn gave a return of 34 bushels and 3 pecks per acre, and the broadcast gave 33 bushels and 3 pecks.

We think, notwithstanding the many points of difficulty which invariably present themselves in wheat cultivation, that a drill depositing the seed deeply, and care being taken, if possible, to sow in damp season, and to secure mechanical consolidation, is the most advantageous system for the bulk of soils. And this not so much for any other reason as for the irregularity of seeding which often attends hand sowing, how well soever it may be executed—as for the uniformity of depth and the mechanical compression of the soil when sowing takes place in a damp state of the soil.

### THE EFFECTS OF THE NEW GOLD FIELDS ON AGRICULTURE.

We have hitherto argued that the gold of Australia and California, even if the present large supply should continue for fifty years, is not likely to affect prices to a greater extent for the nineteenth century than they were affected by the supplies of the seventeenth and eighteenth centuries—namely, from 20 to 30 per cent., that advance being spread over the whole period.

Let us now assume a revolution in prices equal to that of the sixteenth century. This—though we admit the difficulty of obtaining anything approaching to accurate data—we estimate at 300 per cent. Let us consider what the effects of such an advance would be on the agricultural as well as other producing classes, and also on the consuming classes.

Let us suppose the advance to be sudden: so that everybody on waking some fine morning should find everything which they had to dispose of worth three times as much money as when they turned into their beds the night before. What glorious times those would be for the farmers!—wheat up to 120s., barley 60s., and oats 50s. per qr.; beef and mutton 1s. 6d., and butter 2s. 6d. to 3s. the pound. What merry faces we should see at market tables! Come, neighbours, let us drink to the continuance of these golden times, in another bottle at the wine-drinking George, in another tumbler at the punch-drinking Lion, in another pint at the ale-drinking Chequers. How joyous all the country tradesmen would be to find their stock of goods tripled in value! How cheerful the commercial travellers would be, as they ran from ordinary to ordinary—plenty of orders,

money abundant, “clients” cashing up to the day, no bad debts, no bankruptcies, no compositions of half-a-crown in the pound! The war of classes would be at an end. The farmers, and the shopkeepers, and the commercial men who represent the manufacturing interest, would take their extra potations together to the continuance of such prosperity. These feelings, however, would soon subside—sooner than the fumes of the liquor with which they were celebrated. They would subside as soon as the farmers began to buy groceries and clothing; and the grocers, tailors, shoemakers, and haberdashers began to pay their butcher and baker. The farmers and shopkeepers would find themselves in precisely the relative same position as before the advance took place. In exchanging their respective commodities with one another they would give the same quantity of one which they gave for the quantity of another which was its equivalent before the rise took place. Of the counters called “money,” which serve as the medium of exchange, and measure the comparative value of the respective commodities, each would receive a greater number; but the difference which he received with one hand as a seller, he would pay with the other as a buyer; and at the year's end all would wonder how, with money so abundant, and with such high prices, they were none the richer. Then they would begin to learn the difference between value and price.

The value of a thing we have already explained to be its power of purchasing other commodities. Its price is its power of purchasing money. The value of some commodities may, from various

causes, be raised or lowered with respect to others, but the value of *all* cannot be raised. If the value of corn rises with respect to groceries and clothes, groceries and clothes must be reduced in value with respect to corn, and *vice versa*. On the other hand, money, from its abundance, may be so reduced in value, that a larger quantity of it must be given in exchange for every other commodity; prices will then rise. A general rise of prices there may be, and has been. A general rise of values there can never be. We will suppose that the wages of labour rise in the same proportion as the prices of food, clothing, and other necessaries. We will also suppose an Act of Parliament to be passed enacting that, in consequence of the revolution in the value of money, three pounds sterling shall be paid in discharge of all existing rents, debts, mortgages, and annuities, where the contract was to pay one pound, and that the same enactment shall be extended to all existing taxes. It is very evident that under such circumstances all classes would be in the same position, as if no revolution in prices had taken place. Now this is the point ultimately attained during a gradual rise of prices, whenever the advance is complete and prices become stationary.

While the advance is in progress some gain at the expense of others—producers gain at the expense of consumers. The greater portion of every community are both producers and consumers. They who consume as much as they produce will be none the richer: they who consume more than they produce will grow poorer: they who produce more than they consume will grow richer. Producers will gain by the increased price of the raw material which takes place during the course of manufacture; since this increase will be added to the ordinary profits of their business. Producers will gain as employers of labour at the expense of the labourer whose wages generally lag behind the advance in the necessaries of life. Such, at least, has been the case hitherto; but in the present instance there appears every prospect of the tables being turned, by the rage for emigration to the new gold fields. There appears unequivocal symptoms that, from this cause, we shall have two masters in search of one man, instead of two men, as heretofore, in search of one master. The labourer will thus be enabled to command wages not only proportioned to the increased price of all he consumes, but even in advance of it. Producers gain also at the expense of those who are dependent on fixed money incomes. Debtors gain at the expense of creditors. The greater portion of the producing classes are debtors under fixed money engagements—carrying on their business, in part, with borrowed capital. Besides borrowed capital

the farmer is a debtor for a fixed annual sum, as rent. During an advance of price, arising from the depreciation of money, these obligations can be discharged by the sale of a smaller quantity of produce than was contemplated by the debtor and creditor at the time the debt was contracted.

This, however, only affects existing contracts. Capitalists, in making fresh loans, will demand a higher rate of interest; and as a period of advancing prices is always a period of speculation, capital will be in demand, and they will be able to make their own terms. With high prices, too, a larger capital is required to carry on the same amount of business, and there will be as much necessity for borrowed capital in the farmers' business as before. He who required to borrow £1,000 to take a farm of a given size, must borrow £3,000 if prices are tripled. The farmer who holds under a corn rent will find his rent rising with the rising price of produce. The yearly tenant can have his rent raised on half a year's notice. The leasehold tenant will be liable, when his lease expires, to an advance proportioned to the increased price of produce. Tithes, poor-rates, and other charges on the land will increase with increasing prices, though, in consequence of the tithe commutation, the titheowner will not reap the full benefit of it for seven years. But the burthen of the national debt, we are told, will be lightened by a reduction in the value of money, because the interest will be paid with a smaller amount of produce. Let us look at this a little closer. The public taxes are raised for two purposes—to provide for the expenditure of the nation in its quality of a consumer, and to pay the interest on a debt incurred in past times. That proportion which it pays as a debtor may be called twenty-nine millions; while that which it pays as a consumer, for the support of the civil and military establishments, is about twenty-five millions. As you diminish the former by an alteration in the value of money, you increase the latter. The agricultural share of the difference will be but trifling; and great suffering will be inflicted on a numerous class little able to meet the change. Out of 280,869 holders of funded property, 256,858 receive dividends of less than £100 a year, whilst of these 236,653 are under £50 a year.

It must be conceded to those who consider an expanding currency a blessing, that industry is stimulated by a period of rising prices. At such a time the manufacturer gains, as we have already said, by the increase which takes place in the price of the raw material during the course of manufacture; and he thus adds the advantages of the speculator to the ordinary profit of his business. It is the same with the stock of goods in the ware-



houses of the merchant and shopkeeper. All producers, therefore, are eager to maintain an increased supply of goods, and all dealers to get into stock. The reverse takes place during a season of declining prices.

The stimulus thus given to production is, however, of a very evanescent character. It lasts only while the diminution in the value of money is in progress. When prices again become stationary, it ceases; and if we reflect on the privations which rising prices impose on the numerous class of small annuitants, from this diminished command over the necessaries of life, and over the comforts to which they have been accustomed; and if we take into account the misery inflicted on the still more numerous labouring class by the advance of prices preceding an increase of wages, we can scarcely doubt that the advantages of such a state of things are more than counterbalanced by their disadvantages.

It appears to be the very essence of a standard or measure of value that it should be invariable. That immunity from sudden fluctuations in quantity which has been imposed by the laws of nature on the distribution of gold and silver in the earth has been the cause of their universal adoption as the best medium of exchange. Why should it be more desirable to have a variable pound sterling than a variable pound weight or an expanding inch? Each of these would furnish a new way of paying old debts quite as efficacious as a sovereign diminishing year by year in value. These points are well worthy of consideration by the advocates of an expanding currency, whether metallic or non-metallic.

If we appeal to experience, we shall find that during no period of our history were complaints of distress louder among all classes in England than while the great monetary revolution of the sixteenth century was in progress. Great as was that change, it took place so gradually that the advance of prices was scarcely perceptible, except by comparing periods of from ten to twenty years with one another. It was attributed to every cause but the right; and the grand object of the legislation of that age was to counteract the mysterious influence which produced it, and to cause artificial cheapness by laws against enclosures, sheep-walks, regraters, and forestallers, and by penal enactments against those farmers "who, of their greedy and covetous minds, killed their calves as veal, instead of rearing them to be beeves." Passing by the invectives of Latimer against such delinquents, and against step-lords and rent-raisers, all concluding with the celebrated climax in his sermon before the House of Lords, "Verily, my masters, if things continue at this rate, I fear that ere long

we shall be constrained to pay for a pigge a pound."

Leaving this, let us turn to a small book printed in 1581, under the title of "A Briefe Discourse touching the Commonwealthe of this Realme of England, by W. S."—which was republished about the middle of the last century, as the work of Shakspeare, but there is conclusive evidence that he could not have been the author. This little volume consists of a dialogue between the representatives of the different classes of society as they existed at that time—a knight, or large landowner; a husbandman, his tenant; a shopkeeper in a large country town, dignified with the name of a merchant; a capper, or manufacturer of hats; and a doctor of divinity. Each of these descants on the grievances of his own class, caused by the excessive "dearth" of all articles, both of home growth and imported from foreign parts; and that, notwithstanding abundance of everything. Our agricultural friends will perhaps be surprised to find that a period when prices were continually advancing, till they were tripled at least, was a time of agricultural distress. "These inclosures," says the farmer, "doe undoe us all; for they make us pay dearer for our land that we occupy, and cause that we can have no land, in manner for our money, to put to tyllage, all to be taken up in pasture; and where threescore persons or upwards had their livings, now one man with his cattle has all; which is not the least cause of former uprores; for by these inclosures many doe lack livings, and are idle; moreover all things are so dear, that by their day wages they are not able to live." The capper and the merchant—the Manchester men of those days—confirm their statements about the effects of this dearth on the labourers whom they employ. They describe most of the towns of England as going to decay, and join the tenant farmer in attacking the landlords. The knight stands by his order, and defends them in a way which completes the picture of agricultural distress, by representing the sufferings of the owner as well as the occupier of land under prices increasing threefold. "Since ye have plenty of all things, of corn and cattel (as yee say), then it should not seem this dearth should belong of these inclosures; for it is not for scarceness of corn that yee have this dearth; for (thanked be God) corne is good cheap, and so hath been these many years past. Then it cannot be the occasion of the dearth of cattel, for inclosure is the thing that nourisheth most of any other; yet I confess there is a wonderful dearth of all things; and that doe I, and all men of my sorte, feel most grief in, which have no way to sell, nor occupation to lyve by, but only our lands. For you all, with other artificers, may save yourselves meetly well;

for as much as you, as all things are dearer, do araise in the price of your wares and occupations accordingly." The farmer retorts that the landlords raised their rents, and took farms and pastures into their own hands, which used formerly to yield a living to poor men like him. The merchant and capper confirm the charge, which the latter clenches with the declaration that it was "never merry with poor craftsmen since gentlemen turned graziers." The knight admits the fact, but justifies it on the score of necessity. Landlords being, he says, the chief sufferers by the high prices they must either reduce their establishments or raise their rents. He paints in dismal colours the hardships endured by many of the gentry who have departed out of the country of late; driven to give up their households, or to keep either a chamber in London, or to wait on the court uncalled, with a man or lackey after them, when they were formerly wont to keep a score of clean men in their houses, and twenty or twenty-four other persons besides, every day in the week. He declares that "such of us as still do abide in the country cannot, with two hundred a-year, keep that we might have done with two hundred marks sixteen years ago." Since they could not raise the rent of their lands which were let on lease, they were forced to keep in their own hands such as fell in, or to purchase some farm of other men's lands, and to store it with sheep and cattle. The clergyman being appealed to, as to the cause of this dearth, seeing all things were so plentiful, wisely lays it down as a "thing to be mused upon, whether if the husbandman were forced to abate the prices of his stuff, this dearth would be amended: if he should be commanded, for instance, to sell his wheat at 8d. the bushel, rye at 6d., barley at 4d., his pig and goose at 1d., his hen at 1d., and his wool at a mark a tod, the landlord to return to his old rent, would goods, in that case, from beyond seas be brought as good and cheap after the same rate? A man would think yes; for example, if they now sell a yard of velvet for 20s. or 22s., and pay that for a tod of wool, were it not as good for them to sell the velvet for a mark a yard, so they had a tod of wool for a mark?" He then discourses very amiably on the subject of money, and resolves the origin of the increased prices to the alteration in its value; and accounts for the preference given to sheep farming over tillage, by the higher comparative price of wool than of corn, which he traces to the freedom of export permitted to the former, while the export of the latter was too much restricted; and then argues that by giving equal liberty to both, the balance would be preserved, notwithstanding inclosures, since the farmer would chang from corn to sheep, and from sheep to

corn, as he found one or the other the most profitable.

This is a hint well worth the consideration of the farmer at the present day, when the value of wheat is so low compared with that of other descriptions of agricultural produce, and when sheep and dairying do not involve the necessity for permanent pasture. The chief moral, however, which we would draw from the preceding dialogue is, that California and Australia, should they cause as great a revolution in prices as marked the sixteenth century—of which there is no probability—will furnish no remedy either to the owners or the occupiers of land for agricultural distress. The farmers have been led by their political friends in pursuit of too many Will-o'-the-Wisps already; let them not be deluded into the pursuit of any more. Let them regard present prices as permanent, and not give a farthing more of money rent for land which they may be about to take than its present value. Let them not cease—we do not say to ask—but to demand boldly, from their landlords, a reduction of existing rents proportionate to present prices, for they are justly entitled to it.

Will California and Australia continue to yield gold at the present rate for the next fifty years? is a question which must be discussed on geological principles. It depends in a great measure on the fact, whether the gold is found there under conditions different from those of other gold fields which have been exhausted more or less completely, in proportion to the time during which they have been worked, or the numbers employed upon them. The large quantity of gold derived in a short time from the new gold fields, where we admit that the auriferous deposits exceed the average richness, have led many to assert that the observations of our best geologists, respecting the state in which gold is found, and its general scarcity, have been falsified by facts. They who make this assertion forget the numbers and energies of those engaged in gathering the golden harvest. They evidently know nothing of the rocks in which gold is found, either in California or Australia. They belong to that class who disdain to study natural facts, and who veil their ignorance under the specious name of being *practical*. They belong to a body who think that not gold alone, but coal, and every other useful mineral and metal, instead of being limited to certain rocks, may be looked for with success anywhere and everywhere. In the matter of coal, this belief has led many landowners and farmers into expensive trials, which have cost collectively hundreds of thousands of pounds, in situations where the slightest knowledge of the elements of geology would have prevented this absurd waste of

money. But our present object is gold. We shall show that both in California and Australia, as in other auriferous regions, nearly the whole of the supply is derived not from the solid rocks, but from gravel, sand, and clay, formed from their ruins; that the rocks which constitute the original matrix of the gold are the same as those in which it occurs in every other gold field; and that the gold follows the same mode of distribution, both in the rocks and in the superficial accumulations. We must premise that of rocks there are two great divisions, the stratified and the unstratified. The former bear palpable marks of having been deposited beneath the sea: the latter present evidence, equally satisfactory, of having been in a state of fusion like modern lavas. The mass of the stratified rocks has, in its maximum development, a thickness of several miles. Had the strata preserved the original horizontal position in which they were deposited, we should have known nothing of any but the uppermost. The disturbances which they have undergone have exposed the lowest to our view; and the sections afforded by ravines and sea cliffs exhibit the strata more or less inclined, emerging from beneath each other. We are thus enabled to measure their thickness, and to ascertain the order of succession. The same characteristics which have been observed in our own little island are found to exist in every other part of the world. The base of the stratified series consists of a great group called the gneiss and mica slate systems, which are destitute of fossils, and appear, after having been deposited from water, to have undergone a great baking from subterranean heat. To them succeeds the great palæozoic group, or group of ancient life, so called from the peculiar characters of the remains of plants and animals which it contains. It is composed of four sub-groups, of which we need only concern ourselves with three: the Silurian, the Devonian, and the carboniferous systems, because gold rarely ascends so high in the series as the last. The Silurian rocks are represented in this country by the slates of Wales, Cumberland, and South-west of Scotland; the Devonian strata, in their unaltered state, by the old red sandstone of Herefordshire and Scotland—in their altered state by the slates, sandstones, and limestones, of a great part of Devonshire and Cornwall. The carboniferous system comprises the coal mines of Northumberland, Staffordshire, and South Wales, with the mountain, or carboniferous limestone, on which they rest. Now, gold is found in no other rocky matrix than in these three members of the palæozoic group; in the gneiss and mica slate groups below them, and in certain intrusive igneous rocks which have burst through them.

These igneous, or unstratified rocks, form the central nucleus of mountain chains; and the strata, thrown into a highly inclined position, dip away from this nucleus in opposite directions, becoming more horizontal as they reach the level country, where they are concealed by an overlying mass of other rocks. Here is one limitation to the distribution of gold. It is only to be looked for along lines of disturbance which have brought these lowest rocks to the surface. The igneous rocks appear to have been forced through the strata in two different conditions, namely, as solid masses, and in a melted state. In the former case they have produced little or no alteration in the strata with which they are in contact; in the latter case the strata are much altered, so that in the vicinity of the igneous rocks, clay slates, shales, and sandstones assume the mineral characters of flinty slate, micaceous, chloritic, and tuclose slate, and quartz rock, which are usually associated with the great non-fossiliferous gneiss and mica slate group. The igneous rocks, moreover, have shot up into these altered rocks in the form of veins. In the auriferous region of the Ural the gradual change from the Silurian, Devonian, and carboniferous strata, is very evident as the igneous rocks are approached; as is also the absence of gold from the unaltered, and its presence in the altered portions. Here, then, is another limitation to the abundance of gold. It is only to be looked for along those lines of disturbance where the palæozoic slates have been altered as well as upheaved. There is a third limitation in the manner in which the gold is distributed through these rocks. It does not occur in large veins in which the metal is combined with sulphur and other substances, like the ores of copper, lead, and silver; but is either dispersed in small grains of pure gold, often so small as to be invisible to the naked eye, through the substance of the rock, or as small strings and nests in small quartz veins which traverse the altered and the igneous rocks. The hardness of these rocks, the irregular distribution of the gold, the extreme richness of one spot being no guarantee against the extreme poverty of another part of the veinstone immediately adjoining, and the fact that auriferous veins, unlike other metallic veins, are richer near the surface than in depth, all combine to render the raising gold from the solid rock unprofitable. Natural forces, however, have performed, in bygone ages, those operations of breaking down the rock and reducing it to small fragments, which are too costly when performed by human labour. Atmospheric action has decomposed the surface of the auriferous veins, which is their richest portion; and powerful aqueous currents have, in part, effected, by the sorting action of water, the separa-

tion of the metallic and non-metallic particles, leaving for man only to complete the separation by the last process of washing. The gold detritus of these superficial diggings is of two kinds: that which has been transported by aqueous currents of old date acting irrespectively of the existing lines of drainage, and spreading the fragments over plains and hill slopes, and that which has been collected in the river beds by the constant erosion still in operation of the streams upon their banks, composed of these ancient detrital deposits. The former constitute the dry diggings of the gold-washers, the latter are the wet diggings. These are the conditions under which gold has been found in every gold field of ancient or modern times previously known, and they are repeated in California and Australia. The nature of the rocks, the distribution of the gold in the rocks, its distribution in the superficial deposits of clay, sand, and gravel, and the dependence of the supply on those deposits, are precisely the same. The identity of conditions is evident from the fact, that Sir Roderick Murchison, from a comparison of Count Streletoke's description of the rocks composing the Australian mountains with those of the Ural, which he had personally examined, predicted, five years ago, that Australia would prove auriferous, and advised the then unemployed Cornish miners to go out and dig for gold. It is evident, also, from the fact that Mr. Hargreaves arrived at the same conclusion from a personal examination of the gold-bearing rocks of California. Had he been a geologist he might have satisfied himself of this without the trouble of a visit to California, by reading Sir R. Murchison's book on Russia, and being able at the same time to understand what was meant by the names of the rocks described as yielding gold. There is nothing new, then, in the geological relations of gold in the new gold fields. The cause of the abundant yield, which dazzles the eyes of so many, and with which it is wished to distract the attention of the farmers, remains to be considered.

If the gold-bearing rocks of California and Australia are the same as in other gold-fields; and if the distribution of the precious metal be analogous both in the rocks and in the superficial deposits, how, it may be asked, are the extraordinary supplies to be accounted for, in which the produce is reckoned, not by ounces and pounds as heretofore, but by tons? Something must be attributed to the gold-fields being of more than the average richness; but far more must be evidenced by the numbers and energies of those who work them. There are probably at the present moment not less than 150,000 of the Anglo-Saxon race engaged directly in collecting the gold of these regions; besides the numbers employed indirectly in supplying their

wants. When, in any period of the world's history, was such a force employed in collecting the treasures of any other gold-field? The very nature of auriferous regions, confined as their chief riches are to the superficial deposits, renders the amount which they are capable of producing limited in extent. Assume two such regions, each containing fifteen hundred millions' worth of gold. One hundred and twenty thousand hard-working Anglo-Saxons will exhaust the one in fifty years, at the rate of thirty millions a year; and so long as it yields an annual thirty millions, it will rank as a new wonder of the world. The other, in the hands of a few thousand Spaniards, or roving savages, or negro slaves, or Russian serfs, will yield five millions a year for three centuries, and will be deemed scarcely worthy of notice.

The Californian and Australian gold seekers, moreover, are at present skimming the cream of these fields by picking out the richest spots. At Mount Alexander they appear, by recent advices, to have struck out a new kind of work, called "dry nug-getting," which consists in collecting only the larger lumps, without taking the trouble to wash the earth in order to extract the small dust. This is all tending to the more rapid exhaustion of the gold field, because there are many deposits which might be worked remuneratively if worked systematically, the poor and the rich together, but which will not pay for working after being robbed of their more productive portions.

There are three classes of persons hostile to any attempts to reduce the wonders of the modern gold fields to their true dimensions—those who delight in the marvellous; those who have shares to dispose of in the numerous gold companies with which Capel Court abounds; and lastly, those who would make the new golden discoveries their excuse for leaving the tenant farmer to grapple with his present difficulties as best he can: to whose shame be it written when we reflect upon the consequences thus entailed by the thew and sinew of the country vying with each other to quit the shores of our sea girt isle, the consequences of this process of depopulation, at a time when the Government are urging upon us, by every means in their power, the necessity of strengthening our defences by sea and land with a precipitancy known only to the realities of war.

You forget they cry the boundless extent of these new El Dorados. In California there is an auriferous region five hundred miles long by fifty miles wide, and in Australia there is another more than one thousand miles long by a hundred broad. Yes, Sir, and in the Ural there is another six hundred miles long, which has yielded its millions worth of gold, and is now on the de-

cline. As its produce began to decrease, new discoveries were made in Siberia, from which the portion of the Russian gold is now derived. In all these cases it must be understood that deposits of gold are scattered at intervals over so many square miles of country, the productive portions being separated by large tracts of barren ground, while, even in the richer parts, the gold is very irregularly distributed, occurring in some cases near the surface, in others in the middle, of the detrital masses; and again in contact with the rock, beneath a head of fifty or sixty feet of clay, sand, and gravel. The variations of productiveness, horizontally, in a rich deposit, appear equally arbitrary, though they are probably reducible to rules by reference to the action of powerful currents flowing through valleys of a given form, in sorting and arranging the materials according to their specific gravity. Some traces of rules of this kind, deduced from observation, exhibit themselves in the official descriptions in the Australian blue books. As the source of the gold in the mountains is approached, the particles of gold become coarser. These, and the nuggets, are either the surface of veins—the surface, be it remembered, of a gold vein is its richest portion—decomposed *in situ*, or the weight of the nuggets has prevented them from being transported far. Then, again, in narrow valleys having a winding course, there are alternations of rich and barren deposits on opposite sides. Every barren bluff in the course of the valley has a long slope opposite to it, in which the detrital gold has been deposited in considerable quantities. In broad and straight valleys, on the other hand, like the Turon, the particles of gold are smaller and more regularly distributed. These, however, yielding to continuous labour moderate and regular returns, have not the attractions of the more exciting dry nuggetting, with its prizes and its blanks.

The size of the nuggets is insisted on by ill-informed persons, who think the modern gold-fields are such as the world never yet beheld. In that too we can find them a parallel.

Whatever may be the derivation of *nugget* it is a word of good Saxon sound, but it is only our old acquaintance *pepite* introduced under a new name. In the size of their pepites California and Australia have not only not exceeded other gold-fields: they have actually fallen short of them. The famous Grano d'Oro found in Hispaniola in 1502, which is now at the bottom of the ocean, having been lost in the shipwreck in which Bobadil and Rinaldo perished, weighed nearly 33lbs. In 1821 a pepite of 48lbs. was obtained from the gold-washings of North Carolina, with many others of 13, 16, and 24lbs. This was deemed the largest gold boulder

on record until the Russian works of Zarzov Alexandroffsh in the Ural yielded, with several of smaller size, a pepite of 78lbs., now in the Museum of St. Petersburg. Humboldt has remarked that of all the auriferous regions with which he was acquainted, in both hemispheres, the washings of the Alleghanies were the most remarkable for the abundance and size of their pepites; adding, however, that neither there nor in the Ural are these large masses deemed indications of the general richness of the deposits in which they are found. All these nuggets or pepites were lumps of pure gold, unmixed with any of the adhering veinstone in which they had been originally imbedded. It was otherwise with the mass of gold found in Australia by Mr. Kerr's black servant. That was a block of quartz partially decomposed, which contained in separate masses one hundred weight of gold. Had the process of disintegration been complete, these would have constituted so many separate nuggets, of smaller size than some of those which we have enumerated from other gold regions.

The quartz veins which are to yield up their glittering treasures to science, skill, and capital when the superficial deposits shall be exhausted, form the last stronghold from which we shall be tempted to drive those who think that the world is on the eve of a golden revolution by which agriculture is to be made rich.

We have already stated, that though many a gold mine has been opened in the solid rock, it is very rarely that they are sufficiently productive to repay the labour of extracting the precious metal. Of all that have been tried in the Ural, one only has stood its ground; and that, with all the science and skill of the mining engineers employed by the Russian Government, is found less remunerative than the superficial diggings of the average degree of richness. We were told for some time that California was an exception to this rule. The truth, however, is now beginning to transpire. Two or three of the quartz-crushing establishments are for the present remunerative; but from the irregular distribution of the metal in the rock, they may speedily be reduced to the condition of their neighbours. Of these the majority are either falling into debt, even in the hands of the go-ahead Anglo-Americans, remarkable as they are for engineering skill, or where the owners have not had the good fortune to sell them to some English company, they have abandoned them. We do not hear much, as yet, from Australia about quartz-crushing. When we do, we may be certain that, as it resembles the Ural and California in so many other points, it will resemble them also in the general unproductiveness of gold-works in the solid rock.

At an early period in the history of the Californian gold-washings, it was estimated by an experienced and practical miner resident at the diggings, and quoted in an article in the *Quarterly Review*, that in 1849 California would turn out gold to the value of £15,000,000, the earnings of 40,000 diggers; that in 1850 the produce would be £18,000,000, earned by 60,000 diggers; that in 1851 the numbers employed would have increased to 100,000, with the yield of gold diminished to £15,000,000; and that in 1852 the produce would have fallen off to £7,500,000, and the population to 50,000. It was estimated that, after this, the diggings would gradually fall into the condition of those of Brazil, where the annual sum extracted by a slave does not exceed £4; or those of Columbia, where a work employing 60 slaves, and yielding 20lbs. weight of gold, of 18 carats, is considered a good estate. In two respects this estimate has not been borne out. The yield of 1850 did not reach £18,000,000, nor has the population of 1852 fallen off to 50,000; but there are indications that the golden produce of California is passing its zenith. The *New York Herald* for October 31, 1851, stated, on the authority of the Custom House Books, that California produced gold to the value of £13,770,000 in 1850, and the yield for 1851 was estimated at £15,000,000. It appears,

however, that the gold actually exported from California between Jan. 1, 1852, and Sept. 29, amounted to somewhat less than £6,000,000, equal to about £8,000,000 for the whole year. In Australia, the newest discovery is always represented as the richest. Mount Alexander—about which we have been told such marvels—appears by the most recent advices to yield an average weekly return of 24,238 ounces, which, divided amongst its 60,000 gold-seekers, will not give to each of them 30s. a week.

We conclude then, at any rate for the present, our notice of the new gold fields in their relations to agriculture, with reiterated advice to the tenant farmer not to be deluded into the expectation that California and Australia will extricate them from pecuniary difficulties, or produce—even though their present rate of yield should continue for fifty years, which is very problematical—any material alteration, during the longest period of an agricultural lease, on the metallic prices of agricultural produce, as they existed before the Bank Restriction Act at the close of the last century. Let them neither take land, nor hold land from which they can escape, at a rent higher than they consider it worth at those prices, with the “looming in the future” of advancing wages in consequence of extensive emigration.

#### ON THE ABSORPTIVE POWER OF THE SOIL.

It may be remembered we several months ago alluded to the most important *discovery* made in agricultural science for the last century—the power of clay soils to absorb and retain the manurial elements of substances passing through them. We say it is a thorough discovery, and pregnant with greater results than all the rest put together of what have been called new in the science of farming. It was made by H. S. Thompson, Esq., and Professor Way, almost simultaneously; and the latter has now elaborated and further investigated this most important subject, and the results appeared in the last number of the *Journal of the Royal Agricultural Society*.

It may be remembered his previous experiments showed that when any substance containing ammonia, phosphoric acid, potash, or other similar materials, was passed through finely-pounded clay, the most, if not all, of the substance was retained in the soil, and the water filtered through generally in combination with sulphuric acid and lime. He also discovered that the very filthiest sewage, the dunghill drainage, and even the urine of the stable, became not only deodorized, but absolutely tasteless when it had passed through the pounded clay.

Nay, more: he found that mere mixture produced the same effect, and that the clay seemed rather to lose the effect of detaining the manure by incineration, and that sand did not possess the property in any appreciable degree.

But what was the *cause*? Was it chemical, or mechanical, or both? Professor Way instituted a series of very ingenious and satisfactory experiments to decide the question, and seems to have settled the difficult, abstruse point almost to demonstration. His first attempt was to determine if this absorbing or detaining power was due to the little known but most potent class of silicates. He first tried the silicate of lime as the most likely to be present in soils of this class, but found that substance incapable of detaining the ammonia.

He then imagined that the compound silicates might have this wonderful power, derived from the remains of granitic rocks which were present in most of the clays, and fragments of which, especially of the feldspar, exist undecomposed in such soils. These he finely pounded, and digested with a solution of sal ammoniac; but they formed in them no power whatever to absorb the ammonia.

He next conceived that artificially-formed double

silicates might have an absorbing power, while naturally-formed ones had not, on the principle of all recently-formed combinations being more or less fickle, especially when in a highly divided state; and hence he compounded a double silicate, of silicate of alumina and silicate of soda, and a substance resembling natural albite was obtained. We will not follow his process of manipulation and combination; it may suffice to say that this combination, when digested with ammonia and washed, contained a considerable quantity of that substance. The composition of the substance he gives as under:—

Silica .....	52.41 parts.
Alumina.....	29.68 „
Soda .....	17.91 „

This he describes as a substance very slightly soluble in water, not more than three and one-third grains being dissolved in a gallon of water.

But more: he found a similar double silicate of lime, where the latter substance nearly occupied the place of the soda. Similar experiments were made to form double silicates, with ammonia, with potash, and with magnesia, and which were found to replace each other without any apparent injury to the effects of the material.

Nay, more: he found that with silicate of alumina and any one of the bases we have before mentioned, the base will be dislodged by any of the other salts in the list, only in the following order:

Soda,  
Potash,  
Lime,  
Magnesia,  
Ammonia.

Thus, he says, nitrate of potash will turn out soda from its silicate, and a potash silicate will be formed, whilst ammonia will replace any of the other bases.

Hence we find it to be wisely ordered that the very substance so very volatile, and so very necessary and valuable, is just the one which will replace any of the other materials which seem to occupy a slighter place in their usefulness as manures.

The Professor goes on to say that it is possible some day to manufacture this ready-made manure-holder at a reasonable cost, and so to give us far greater power over the fertility of soils. With his practical deductions as to growing wheat for a great number of years in succession by the appliances of the chemist—with these we must say we have less sympathy.

## THE AGRICULTURE OF THE BIBLE.

### THE IMPLEMENTS OF TILLAGE.

(Continued.)

An opinion is often expressed that the first implement of tillage was simply a strong limb of a tree with a projecting branch. This is mere conjecture, and seems opposed to evidence. Adam was the first cultivator of the soil; he was "put into the Garden of Eden, to dress it and to keep it;" and he had higher skill and nobler work than any other gardener who ever broke ground. But he did not cultivate by spell or miracle; he did not achieve results without the use of corresponding means; and, since he performed nice tillage, he must also have possessed nice tools. If he did not obtain these in some intuitive or supernatural way, he must have speedily invented them. He was not set to make bricks without mortar—to prune trees without a pruning-knife—to do angel-like work with savage-like implements. The infinitely gracious Being who "planted" the garden for him, and appointed him to dress it, doubtless furnished him, directly or indirectly, with all suitable appliances.

Adam *dressed* the garden, and Cain *tilled* the ground. The Hebrew word in both cases is the

same, and has the sense of *labouring* or *servicing*. Adam *served* the garden, and Cain *served* the field. Both laboriously tilled the soil; the former not with pain indeed, but nevertheless with energy. They did not merely scratch the surface, or stir what was loose and friable; but they worked the land to a due depth, and reduced it to powder. They performed all the service, hard and searching, which was requisite to maintain fertility. May they not be presumed, therefore, to have had the same or similar implements? Adam, in becoming a sinner, did not forfeit his physical knowledge; and though, when driven from Eden, he may have left all his tools behind him, he yet carried with him ability to fabricate others of similar form, and probably out of similar material. He could scarcely fail to fashion all his agriculture in the field after the model of his horticulture in the garden. The very stubbornness of the soil in resisting him, and the sweat, and fatigue, and exhaustion which now accompanied his labours upon it, would rouse him to recollect well, and to imitate closely, the implements of his Edenic tillage. And whatever good

things were made for himself, were made also for his children, and would be preserved or imitated throughout many centuries.

But working in metals seems essential to the constructing of any good tillage implement; and this is commonly supposed to have been unknown till the time of Tubalcain, who belonged to the seventh generation after Adam. He is called, in the authorised version of the Bible, "an instructor of every artificer in brass and iron." But these works, even as they stand, do not say that he was the *only* instructor in the working of metals—still less that he was the *inventor* of the working of metals; and, if closely translated from the Hebrew original, they will read, "he was a *fabricator* of every cutting instrument of brass and iron;" and, if interpreted according to the light thrown upon them by some other passages, they may mean that he was the fabricator of every peculiarly sharp kind, or every very nice kind, of ploughing implement. In any case, the previous use of the metals seems distinctly implied. Tubalcain was not an inventor, but an improver. What he did was not to introduce metallic powers to the services of husbandry, but to give them finer forms and a keener edge.

Assume tillage implements at the time of the flood, and down to the time of the dispersion, to have been in a state of pretty high perfection, and they must soon after have become widely diversified in adaptation to different soils and climates. Some of the dispersed tribes settled on low, hot, thirsty plains, which derived all their fertility from the floodings of turbid river-water; and they must have been forced to make their implements light and toyish—fit only for covering seeds and promoting after-culture, and expressly suited to avoid disturbance of the ground, or to make that disturbance a minimum. Others settled on high, hot, wetish uplands, which derived their fertility partly from rains, and partly from artificial deposits; and they must have been forced to possess more implements than the former, and to make them heavier, and to adapt them to a decided working and powdering of the soil. Others settled on cold, stiff lands, situated far from the tropics, drenched with excessive moisture, and owing their main fertility to thorough culture and abundant artificial deposits; and they must have been forced to have a still greater number of implements, to make them proportionably heavy, and to adapt them to deep tillage and laborious georgy. Others settled on territories of still different character, and others in many kinds of land of intermediate character; and all these, in the degree in which they preserved and applied the primeval skill of the Noabie patriarchs, must have modelled the implements into new varieties. To take a right view of a known ancient

agricultural implement, therefore, we must treat it, not as a specimen of all the implements of the period, but only as the implement of the particular country to which it belonged; we must look, not at its adaptations to the tillage of all lands, or of any lands, but only at its adaptation to the tillage of the one land on which it was employed.

The earliest agricultural implements certainly known to us is the sarle of the Egyptians. This was like a very light pickaxe, somewhat in the form of the letter A, with the one limb longer than the other. It was worked by hand, in the easy manner of a draw-hoe, and usually made very small ruts and stirrings, far more resembling scratches than furrows. It no doubt comprised several varieties, which differed somewhat widely in weight and work; but in all of them it was exceedingly simple, almost like a plaything, and suited to make scarcely larger ruts than a common walking-stick. Some moderns have ignorantly denounced it as a barbarous toy; and others have absurdly cried it up as the germ of the modern plough. It was really not a tillage implement at all, for the use of breaking up the ground, or pulverising it, or otherwise making it ready for the reception of the seed; but was an implement only and expressly for effecting the peculiar culture of the valley of the Nile. The soil on which it operated was a fresh deposit of river silt—clean, powdery, porous, uniform—reeking beneath the hot rays of an unclouded sun—skinning or cracking over an open or thirsty subsoil—all ready in texture and fertilisement for receiving seeds and nourishing plantlets—and capable of no other aid from man than a few slight scratches to cover the seeds, and to let in free supplies of air. Tillage, in every ordinary sense of the word, was there impracticable. Any attempt at it would have done much injury, and could not possibly do any good. The mere silt itself, just in the state in which it was left by the river, possessed all requisite powderiness and fertilisement, and was in the fittest possible condition for the germination of seeds and the growth of crops. The very sarle would have hurt it by a too deep rutting, and could scarcely be too light in its own structure, or too lightly applied, in order to do its proper work with the largest amount of benefit. If all the other kinds of agricultural implements throughout the ancient world were as suited to their respective countries as the sarle was to Egypt, they must have been truly admirable.

The chief tillage implement of the Israelites was a plough. But this was very much lighter than almost any plough now used in Britain, and at the same time very much heavier than the Egyptian sarle. Its work was to break up and stir clean,



light, open land, and to cross-plough it, and cover seed. Fertility was derived partly from natural disintegration, partly from artificial deposits, partly from rain, and partly from artificial irrigation. The soil was thin and pulverulent, and was naturally cleaned of weeds by the parching heats of the dry season. The subsoil was open, and too greedily drank up all the water which ever reached it. Nothing, or very little was needed for cleaning the ground, for making it porous, or for pulverising and mixing it. The chief requisites were the opening of the soil to the weather, the turning in of manure, the covering of seed-corn, and the prevention, rather than the promotion, of all escape of moisture. The utmost care was necessary not to occasion either a rapid or a deep evaporation, and not to create a too great thirst for the waters which were afterwards supplied by artificial irrigation. The plough, therefore, was small and sharp; it worked lightly and shallowly; and it was drawn by asses or by bullocks, yet could readily be carried by a man from field to field.

All light lands situated in warm climes, and requiring the aid of irrigation, even so far north as Lombardy, are in essentially the same case as the lands of the ancient Israelites. They afford very trifling lodgment to weeds, and owe their fertilisation mainly to substances conveyed in rain and in irrigation-waters, and have comparatively easy work to do in the digesting of nourishment for the crops, and require but slight stirrings, either to keep them well open, or to make them equable and uniform. They maintain of themselves, with scarcely any help from the plough, all the proper conditions of porosity; they spontaneously imbibe, through all their parts and down to the subsoil, the liquid fertilisings periodically conveyed to them; and they undergo, from year to year, no further disturbances by the action of crops than can be readily put to rights by very easy tillage. To understand the Israelitish plough, therefore—either in the beauty of its adaptation to the soils of Canaan, or in the beauty of the Bible's allusions to it for the illustration of certain great moral lessons—we must look, not at the depth or weight, but at the sharpness and efficiency of its action.

It consisted of parts which British farmers might call stilt, beam, coulter, and bridle. But the stilt was single; the beam was small and light; the coulter performed the office of both coulter and share, and seems also to have assisted the end of the beam in slightly doing the office of a mould-board; and the bridle was but limitedly an integral part of the plough, and comprised all the separate or connected apparatus for yoking the team. The characteristic part was the coulter. This, in the authorised version of the Scriptures, is called the

ploughshare. It was made of a kind of steel, and did not differ much in hardness and temper from the finest cutting instruments. Hence the beautiful prophecy: "They shall beat their swords into ploughshares, and their spears into pruning-hooks." Steel was invented prior to the age of record; or perhaps it was the invention of Tubalcain; and it was used by the Israelites, both in a softer variety for forming their edge-tools, and in a harder variety for keeping them sharp. Hence, in the days of Samuel and Saul, when the Philistines had got the upper hand in Canaan, and had drawn all the workers in metal into their own territory, "all the Israelites went down to the Philistines to sharpen every man his share, and his coulter, and his axe, and his mattock; yet they had a file for the mattocks, and for the coulters, and for the forks, and for the axes, and to sharpen the goads." What these several implements, or parts of implements, were, cannot be very precisely defined; but at least two of them belonged to the plough, and probably were different varieties of the coulter, adapted in edge, form, and depth, to widely different kinds of soil, or to different stages of tillage. These two are designated in the Hebrew by words of the utmost possible kin to each other, and both of the same radix as the word which ought to be translated "cutting instrument," but which the authorised version unfortunately translates "artificer," in the passage about Tubalcain.

The modern mould-board plough, in almost all its varieties, while differing widely from the ancient Israelitish plough in structure, differed still more widely from it in action. It cuts land into furrow-slices, so as not properly to stir, or pulverise, or work it, but to dispose it in a series of thin parallel disseverments. It upheaves each furrow-slice by pressure, in the manner of a lever upon a fulcrum, so as to consolidate the subsoil, or to form over it a kind of floor, technically called a "pan." It effects the perpendicular cut in the driving manner of a wedge, so as to compress each furrow-slice, or at least the most resisting portions of it, into firmness and cloddiness. And it deposits the furrow-slices, not invertedly, but about three-fourths over, shoulder to shoulder, like the solid loads from a wheelbarrow, so as to convert the land into an alternation of packed tubes and open lines. Hence arises a necessity for mighty contrivances and labours—draining, trenching, subsoil-ploughing, grubbing, harrowing, rolling, and clod-crushing—to make the subsoil porous, and the surface-soil powdery. But the plough of the ancient Israelites neither squeezed, nor wedged, nor compressed. It produced all its simple, direct, good effects, without any accompaniment of bad ones.

Its coulter went through the land almost as lightly as a grubber-tine, or a harrow-tooth, or a pointed walking-stick. It helped to break clods, but never helped to make any; it cut the ground when cutting was necessary; it stirred and mixed, and did nothing more, when nothing more was needed; and, in general, it left the soil once and for all in a state of either comparative or complete readiness for the seed. In the case of a cloddy field, indeed, an additional implement of mongrel character between harrow and roller was probably used; but, in the case of all ordinary friable fields, the plough alone seems to have been enough. No such array of pulverising implements was either known or needed as crowds the yards of our agricultural shows—no scarifiers, or cultivators, or Norwegian harrows, or flexible harrows, or grooved rollers, or subpulverisers, or trenching tools, or any implements in the least allied to them; and the absence of these has often been ignorantly regarded as evidence of the rude condition of the husbandry of the Israelites; but it really proves, if it prove anything, that their plough, as compared with ours, and as adjusted to the conditions of the particular kind of tillage it had to perform, was an eminently excellent tool.

#### THE WORK OF TILLAGE.

The Israelites, and the Hebrews before them, knew well the value of pulverisation. They were not such dolts as to think that large crops would be produced by clods. They therefore *levelled* their fields, or made them smooth or powdery, but they did not therefore *harrow* or *roll* them. Three texts of Scripture indicate their pulverising usages; and one of these, in our version, speaks of harrowing, and the other two of breaking clods; but all, in the original, have a word which signifies simply to make plain or smooth. "Canst thou bind the unicorn with his band in the furrow? or will he harrow the valleys after thee?" "Doth the ploughman plough all day to sow, doth he open and break the clods of his ground?" "I will make Ephraim to ride; Judah shall plough, and Jacob shall break his clods." To "harrow the valleys" was simply to smoothen the alluvial fields; and "to open and break the clods of his ground," was simply to level and smoothen his land. The last of the three passages may imply, that the smoothening process was distinct from the ploughing one; and the other two may imply that they were the same. The fact of the smoothening is certain; but the means by which it was done, whether the plough alone, or some additional implement, is left doubtful. A "harrow of iron" is elsewhere twice mentioned in the English authorised version of Scripture; but the thing so designated was the

thrashing-sledge, or "sharp thrashing instrument, having teeth," used only for beating out the corn on the thrashing floor, and utterly incapable of any kind of tillage-service in the field. Some writers think that the Israelites used a harrow, formed of a thick clump of wood, with spikes, and held into the soil by a man sitting upon it; and they possibly may be somewhat right in their conjecture; yet they have no better evidence for it, than that something similar is at present used by some of the people of the East. The plough clearly was the grand implement of tillage, often the only one, and was worked, from the earliest times, with high skill and adroitness. Job and the other patriarchs, as well as the kings and the prophets, were acquainted with it for traction by bullocks, and for smoothening the land. It was worked "all day," not only to break up the soil, but to prepare it for the seed. It was handled with such nicety of cut and regularity of furrowing, as not only to stir the land, and turn in the manure, but to make the surface uniform and finely grained.

The Israelites were brilliantly distinguished from all the great commercial tribes of antiquity as a nation of agriculturists; and they are no less remarkably distinguished from all the great farming communities of modern times as a nation of ploughmen. Allusion is often made, in British literature, to the plough, as a metonymic name for all tillage, or for all agriculture; but the same allusion in the inspired writings has immensely greater force. Among Britons, ploughing is only one of many processes of preparing land for seed; but among the Israelites it was the main part of that preparation—the whole of the working of the soil, everything which they did or could do, except manuring and sowing, to obtain from Heaven the blessing of a corn harvest. To "plough iniquity," therefore, is to make iniquity the business of a man's life. To "plough in hope," is to use every means, obey every command, observe every ordinance, requisite or conducive to hope's fulfilment. And to "put one's hand to the plough," in the matter of religion, is to devote to it heart and soul—to adopt its faith and its duties as the grand end of all existence.

The furrows made by the Israelitish plough were ruts, similar to those made by the Egyptian sarche, but larger; and they appeared on the land like the close parallel lines of laid paper, or like the close parallel grooves of ribbed cloths. Any imagination might picture them as stripes inflicted on the soil. Hence the church's complaint of the conduct of her persecutors—"The ploughers ploughed upon my back; they made long their furrows." The "ridges," too, or the things so miscalled in

the authorised version of the Scriptures, were grooves, made in precisely the same way as the furrows, but with a different breadth or different action of the coulter; and they ought to be called ducts, or incisions. The design of *our* ridges is to throw off excess of rain water, and the design of *our* furrows is to carry the water readily away—the former acting like umbrellas, and the latter like drains; but the design of both the ducts and the furrows of the Israelites was to *retain* ter, whether coming upon it naturally in the way of rain, or artificially in the way of irrigation, and to assist the equal distribution of it through every part of a field. Drought and watering had nearly the same relations to vegetable growth in the open grounds of Palestine, as in the glazed hothouses of Britain. To neglect making artificial irrigations, or to omit a due provision of ducts and grooves for effusing these over all the soil, and for catching and economising all the direct fall of rain-water, was a sure cause of sterility or of meagre crops. Hence the force and beauty with which the allusions of Scripture link together the ideas of furrows, water, and fertility. “If any land cry out against me,” said Job, “or that the furrows likewise thereof complain, let thistles grow instead of wheat, and cockle instead of barley.” “Behold,” said Ezekiel, “this vine did bend her roots toward him, and shot forth her branches toward him, that he might water it by the furrows of her plantation. It was planted in a good soil by great waters, that it might bring forth branches, and that it might bear fruit, that it might be a goodly vine.” And said David, in his hymn of gratitude for the beneficence of God in the weather and the seasons, “Thou visitest the earth, and waterest it; thou greatly enrichest it with the river of God, which is full of water; thou preparest them corn, when thou hast so provided for it; thou waterest the ducts thereof abundantly; thou settlest the furrows thereof; thou makest it soft with showers; thou blessest the springing thereof; thou crownest the year with thy goodness, and thy paths drop fatness.”

The management of the plough—of any kind of plough—is now, and always was, a task of great nicety and difficulty. It cannot be taught by verbal instruction; it cannot be learned without great reflection, and practice, and perseverance. It often fails to become good, or tolerable, after many years of constant trial; and it needs to be learned over again, or very materially modified, when even the expertest proficient in it puts his hand to a different kind of plough from the one to which he has been accustomed. Bad ploughing, even with the prime ploughs of Britain, is very common, very various, and exceedingly mischievous, some-

times causing a serious deficiency in the crop, and occasionally damaging the land for years. The simpler the plough is, the higher is the skill requisite for working it, and the greater may be the amount of evil from mismanaging it. Hence was good ploughing among the Israelites a very ticklish and dexterous affair. The ploughman needed to exercise many of the same attentions which are requisite in Britain. He required, also, to conduct his operations with special reference to the equal distribution of the rain and irrigation waters; and he was all the more bound to make regular depths, and breadths, and parallels in the furrow, that his work was final, and could not, like that of a British ploughman, be modified or amended by subsequent operations. He required, in particular, to plough strictly in line, to keep firm hold of the handle, to lean forward to the beam, and to look keenly and constantly on the coulter, in order that every part of every furrow might be straight and uniform. Whoever did otherwise was no fit ploughman in the land of Israel, and might, by his slovenliness or his errors, do tenfold more mischief than all his labour was worth. How beautiful, then, was our Lord's allusion, and how forcibly must it have struck the mind of every Jew—“No man, having put his hand to the plough, and looking back, is fit for the kingdom of God!” The tilling of the ground was the type of all the routine duty of religion: the “peculiar people,” the nation of agriculturists, whose code of agrarian law came to them from the Most High, were the type of the Christian Church; and “the promised land,” which they held by direct tenure from Heaven, and which was maintained in equal distribution among all their families by a jubilee institution, was a type of the Christian dispensation, or reign of the gospel, or “kingdom of God.” And, as no man was a profitable or proper member of the Hebrew commonwealth who did not take earnestly to the plough, and work it dexterously, so no man is a worthy or true subject of the Christian economy, who does not go into its duties with all his heart, and make them the earnest aim and end of his existence. Ploughing *out of line*—a thing which was certain to be done when any man “put his hand to the plough, and looked back”—was in such bad repute, even among the Romans, that the Latin expression for it (*delirare*) came eventually to signify to *dote*, or *rave*, and, in fact, is the etymon of our own word *delirious*.

The Roman ploughs, in the time of Christ, had acquired much variety, and become well adapted to the peculiarities of Italian tillage, and were probably not unknown to the Jews. Cato mentions two—the Romanicum, proper for stiff soil, and the Campanicum, proper for light soil. Varro de-

scribes one, with seemingly two mould-boards, which was used for turning in seed. Pliny speaks of adjusting or modifying one plough-frame to different uses. Palladius mentions a simple plough and an eared one, and says that the latter was employed on low flat land for laying up sown corn on a higher furrow, in order that it might not be injured by stagnant water in winter. "It is probable," said the Rev. Adam Dickson, in his work on the "Husbandry of the Ancients," in 1788, "that I shall be considered as very partial to the ancients, if I do not allow that the moderns excel them in the construction of their ploughs. We are not, indeed, so well acquainted with the construction of the ancient ploughs as to make a just comparison. I shall only observe that, from the few passages in the rustic author's concerning them, it appears that the ancients had all the different kinds of ploughs that we have at present in Europe, though perhaps not so exactly constructed. They had ploughs without mould-boards, and ploughs with mould-boards; they had ploughs without coulter, and ploughs with coulter; they had ploughs without wheels, and ploughs with wheels; they had broad-pointed shares, and narrow-pointed shares; they even had, what I have not as yet met with amongst the moderns, shares not only with sharp sides and points, but also with high raised cutting tops. Were we well acquainted with the constructions of all these, perhaps it would be found that the improvements made by the moderns in this article are not so great as many persons are apt to imagine."

These "ancient" ploughs were ancient only in comparison with our times, and were modern in comparison with the times of the early Israelites. All were Roman; and they contrast as strongly to the simple ploughs of the Israelites as the entire circle of the Roman agriculture contrasts to the entire circle of the Israelitish agriculture. Yet the kind and conditions of the tillage by them, as well as the kind and conditions of that done by the Israelitish ploughs, are possibly essential to a full illustration of some of the agricultural allusions of the New Testament. They were fitted for stubborn work, and went through it sternly, and yet sometimes failed to maintain fertility, and had to be aided, or superseded, after a very few years, by the process of burning. Hence, perhaps, the statement, "The earth which beareth thorns and briars is rejected, and is nigh unto cursing, whose end is to be burned." The Roman ploughs too, though so various in character and complex in structure, owed no mean degree of their power to the selection and preparation of the materials out of which they were made. Virgil's well-known recipe for manufacturing them illustrates the niceties of their

fabrication, and suggests how very much skill and artificership were probably employed in making the very simplest of the ancient ploughs:—

Form'd for the crooked plough, by force subdued,  
Bend the tough elm, yet green amid the wood;  
Beyond eight feet in length the beam extend,  
With double back the pointed share defend,  
Double the earth-boards that the glebe divide,  
And cast the furrow'd ridge on either side;  
But light the polish'd yoke of linden bough,  
And light the beechen staff that turns the plough;  
These long suspend where smoke their strength  
explodes,  
And seasons into use, and binds their pores."

Any account of the intrinsic qualities or domestic habits of the animals of the farm, does not properly belong to a notice of the work of tillage. Yet we must remark on the fact that the only beasts of draught used by the Israelites were bullocks and asses. This startles many Britons, and appears to some of them ludicrous, and to others contemptible. But, even at the present hour, and amid the entirely altered circumstances of European agriculture, horses are not everywhere the best draught animals. Many a consideration, in many a place, makes oxen preferable—such as their cheapness, their permanency of price, their comparative freedom from disease, their availability for the shambles, the perfectness of their adaptation to rural life, their freedom from every association of pomp and war, the simplicity of their harness, the gaminivorousness of their appetite, and the abundance of pasturage or forage; and these considerations, together with some ideas of typical accordance with the prefigurative ordinances of the Mosaic religion, gave most decisive verdict in favour of the Israelitish bullocks. Some of the same reasons, or similar ones, were scarcely less in favour of the asses. Both the bullocks, and the asses too, particularly the latter, were of far finer kinds than ours—less affected by the climate, more docile in disposition, and far better suited to the yoke. But there were then no heavy draught-horses like ours: and such horses as could be had resembled the modern Arabs and barbs, and snorted and pawed for war. The same benignity and wisdom which pervaded all the beautiful peculiar system of the Hebrew commonwealth, and adapted every law and observance to the peaceful, rural, religious circumstances of the people, is clearly apparent in the farm-field use of the bullock and the ass, and in the rigid prohibition of the horse.

The bullock and the ass were of such different size, and power, and disposition, that they could not profitably pull together in one team; and the divine law looked so closely to the interests of every man who might be inadvertent to this as to say,

"Thou shalt not plough with a bullock and an ass together." Bullocks were subject to impulses of fury, and asses to fits of stubbornness, though in a much less degree than with us, and they greatly complicated the ploughman's labours by their occasional unsteadiness. But any very turbulent bullock was made easily manageable by means of a hook of iron in his nostril, or a ring of rope on his lip, with an attached cord to check or jerk it, and to make it play on his respiration. Hence the metaphor in the divine denunciation against Sen-

nacherib, "Because they rage against me, and thy tumult is come up unto mine ears; therefore I will put my hook in thy nose, and my bridle in thy lips, and I will turn thee back by the way by which thou camest." A long staff or pole, too, was carried by the ploughman, or suspended on the plough, for goading the cattle, and this terminated in a sharp iron spike, and was capable of being used in war as a spear. Hence do we read that "Shangar, the son of Anath, slew of the Philistines six hundred men with an ox-goad, and also delivered Israel."

## POTATO DISEASE.

The Legislature of Massachusetts, in the year 1851, offered a prize of 10,000 d. to any one who should satisfy the Governor and Council that, by a test of at least five successive years, he had discovered a sure remedy for the potato rot. Several communications have been received on the subject, which are published by the authority of the legislature, of which we publish the following summary by the Hon. Amasa Walker, Secretary of State:—

Although these communications may not furnish any perfect cure or preventive of the potato disease, yet they agree in so many important points, and offer so many valuable hints, relating to the nature, cultivation, preservation, and improvement of the potato, that they cannot fail to be of great public utility. The similarity of views expressed by the most intelligenced writers, relating to the nature, cultivation, disease, and cure of the potato, is truly remarkable, and we think auspicious. Among the principal points, relating to which there is a general concurrence, are the following:—

*Soundness and Vitality of the Seed.*—Renewing the seed from the ball of healthy vigorous plants every few years, even resorting to the native place in South America, and taking the seed from the wild potato, is considered important. When potatoes are to be raised from the tuber, sound, healthy, whole potatoes are recommended for planting. Cutting potatoes is decidedly condemned. Anything which impairs the vitality of the seed increases the liability to disease.

*Quality or kind of Soil.*—A dry, light, loose, warm soil is considered necessary to the soundness and health of the vegetable, as well as to its richness and flavour, the latter depending quite as much on the quality of soil as on the variety of seed. A wet, heavy, compact soil, directly promotes the disorder. Far up on the side of a mountain or hill is a favourable location for the growth of the potato; and new land contains more of the qualities requisite for its nourishment and health than old or worn out soils.

*Influence of Atmosphere.*—Potatoes should be as little exposed to the air as conveniently may be. Their natural place is under ground. By too much exposure they become poisoned, and turn green. Some recommend depositing them for the winter

in holes under ground in a dry soil; or if kept in a cellar, to preserve them dry, in small quantities, in sand; and to keep them cool. Keeping large quantities in a body in the cellar is by some supposed to promote heat and putrefaction. Planting in the fall is recommended by some, as potatoes left in the field over winter are observed to come forward earlier in the spring, to grow more vigorously, to get ripe earlier and before the blighting rains of August, and to be more sound, fair, and healthy.

*Manures.*—All antiputrescents, such as lime, wood-ashes, pulverized charcoal, plaster, salt, nitrogen, &c., are believed to contribute directly to the health of the potato, as well as to add to its richness and flavour; and, of course, to prevent putrefaction and disease. Of other manures, well rotted compost is preferred. Stable manure is too strong and heating, and produces ill-flavoured, unhealthy potatoes, and is decidedly condemned.

*Disease, Contagion, Old Age, and Death.*—These are common to vegetables as well as to animals. All are liable to disease, some more, some less, according to circumstances, predisposing causes, and preventive means. Some vegetable diseases are believed to be contagious. The present disease is thought by many to be of that class. One field of potatoes is liable to take the disorder from another field. Potatoes are predisposed to disease by bad cultivation, old age, bad soil, bad manures, sudden changes of weather, warm rains, &c.

*Ravages of Insects, Fungi, &c.*—The best writers consider the ravages of insects as at most but a predisposing cause, rendering the potato more liable to disease by enfeebling the plant. By many writers insects are considered as remotely affecting the potato; by others, as having no effect at all. The fungus on potatoes is not the cause of the rot. It finds the potato, previously diseased, a fit subject for its operation.

The general conclusions to which the facts presented in these various communications seem to lead us, are—

1. That the disease has a striking resemblance to the cholera, and probably exists in the atmosphere.
2. That it is doubtful whether any specific cure has been, or ever will be, discovered; but

3. As in cholera, certain preventives are well ascertained, by the application of which the liabilities to disease may be greatly lessened.

4. That by obtaining the soundest seed, by planting in the most favourable soils, and by using the most suitable manures, we may have a good degree of confidence in the successful cultivation of this useful vegetable.

5. That we may expect that, like the cholera, the potato rot will become less and less formidable from year to year, and eventually subside into a mild and manageable epidemic, if that term may be used in such a connexion.

The several points on which there is an unanimity of opinion are worthy the especial attention of farmers. By a careful selection of seed, and locality, and particular reference to the kind of manure used, very much of this disease may be avoided. If facts like the above, well substantiated by experiments in all sections of the country, could be presented to the entire mass of farmers, and they would govern their modes of culture by rules so established, we cannot well estimate the increase which would result in a single year in a crop so extensively cultivated as the potato.

### THE CHEMICAL CONSTITUENTS OF WOOL.—INJURIOUS EFFECTS OF THE LATE INCESSANT RAINS ON THE HEALTH OF SHEEP.

Wool is one of the best paying articles of the present day which the farmer has to dispose of, and it is more than probable that this may be the case for some years to come, as it cannot be increased but by a slow and gradual process; and the *mere* time which is necessary to do this may be considerable; for there are checks, whenever life is concerned, which always prevent illimitable extension of individual species. Under these circumstances, it cannot be unimportant for us to reflect a little upon the natural character of the material submitted for consideration.

Wool chemically consists of 98 parts of organic matter, including sulphur, which is chiefly driven off by burning, and 2 per cent. of ash. The organic part is composed of the following elements:—

Carbon .....	50.65
Hydrogen .....	7.03
Nitrogen .....	17.71
Sulphur combined with oxygen ....	24.61

100

Van Laer made the ash to contain:

Soluble chlorides and sulphates .....	0.51
Oxide of iron .....	0.39
Phosphate and sulphate of lime, phosphate of magnesia, and silica .....	0.20

1.1

Now, though there is some difference between this and the average per-centage of ash found in the generality of wools, yet it is abundantly significant of the fact that a *vast quantity of sulphur is necessary to the formation of wool*—the sulphur, first of all, which unites with the oxygen in the organic portion; that which unites with the lime, and other alkalis of the ash, making the whole a considerable amount—not less, perhaps, than six per cent., if not a greater proportion. Hair, which nearly resembles wool in its chemical composition, contains five per cent. besides the sulphate of the ash. Hence, assuming an acre of land to

carry ten sheep the year round, including turnips, and these to produce 80 lbs. of wool, they will annually withdraw from the soil 4.8 per cent. of sulphur. But, taking the whole at five per cent. only of the fleece, at least five millions of pounds of sulphur are taken from the soil of Great Britain. These united with oxygen in the shape of sulphuric acid, will be equal to 8,300,000 lbs. of that material.

So much for the chemical constituents of wool, showing that it absorbs nitrogen and sulphur from the soil, as well as phosphorus; and therefore those who expect to obtain a proper quantity of wool from their soil—in other words, must give that animal the power to secrete this from the food on which it feeds—should take care to supply it. Let this be deficient, and an immediate deterioration in quantity or quality of the wool or hair will take place. The same precisely happens when the lambs absorb the vivifying material in the shape of the milk they extract. And, indeed, all ewes which have nourished lambs are more or less deficient.

The wool is nature's covering of the skin. The hair of the hot climate, of which the sheep was most probably an early denizen, is by colder climate, converted into a substance softer, more curly, and better suited to resist the cold, being a slow conductor of heat. Man deprives the sheep of this covering at a season when the animal can well spare it, and converts it into clothing for himself; while the sheep in summer, by the growth of its wool, has provided for it another coat against the chills of the succeeding winter. The wool, like the hair of a human being, is not at all unlike a plant. Grown in a receptacle for it, to which nourishment is conveyed by a great number of vessels, and so supplied with the means of support. In its progress from its roots to the surface it passes through that which is abundant in all healthy animals, especially about the breast and shoulders, but really covering the entire animal in the finest wool-producing breeds:

this is an alkaline material, composed of the carbonates of potash principally, and mixed with a little animal oil. Hence it is a real soap; and this is one of the elements of sheep-washing—assisting any stream of soft water to cleanse the dirtiest fleece, if it only be not stained, which even soap will sometimes not remove.

The use of this, either in the animal economy or in the formation of the wool, is not yet decidedly understood, but probably it is one of the means by which it is lubricated, kept from matting or felting, and preserved in a soft and pliable as well as fine condition. We see this somewhat exemplified in the fact of those sheep which have the largest amount of yolk—the Merinos—having the finest wool; and also those animals which have suffered from fever, or other similar diseases, and where the yolk is thus dried up, the fleece will become a perfect felt, called *cotting*.

Furthermore, the soils on which sheep feed, should have plenty of alkaline materials. How far the specific potash may be necessary we will not pretend to say. The animals may in their economy have the power of substituting one alkali for another, as we are persuaded plants have, between some alkalies—lime, for instance, and magnesia, and probably potash and soda. But more extensive analyses of wool ought to be made; and we would suggest it to be a very proper subject to investigate by the Royal Agricultural Society of England and the Highland and Agricultural Society of Scotland, by their chemists, Professors Way and Anderson.

The flockmaster should always consider the object of his operations. He has to produce both wool and mutton. Wool alone will not pay, and possibly mutton-producing will not. The remuneration is to be sought between the efforts of the two put together. But the breeder must beware lest either be altogether sacrificed to the other. Wool has certainly given way to mutton in general estimation and practice; and the time is probably come when a little reverse of this ought to take place. Whenever, if it should arise, that the luxurious habits of the people of this country will make fine wool pay, irrespective of mutton, the Merinos will become the breed in general cultivation.

The incessant rains which have fallen during the last six weeks have had a serious effect upon sheep fed on turnips, and we hardly remember a season when the skill of the farmer has been more required to keep them in health, not to say in a fattening condition.

The sheep is an animal which cannot bear exposure to wet. To know this, it is only necessary to see the caution and care with which they select a clean place when walking, and how it requires ab-

solute force to induce them to step into wet or into dirt.

But on the fleece the rain has by far the most injurious influence. The yolk, consisting of oleaginous and alkaline mixtures, washes out, and thus the vital energies are to be set at work to replace this loss, in lieu of growing fat and muscle; while the fleece, instead of being a cold-repeller, is literally a "wet blanket," and thus converted into a source of evaporation and waste of animal heat. The wonder therefore ceases to be whether they can thrive and fatten when on turnips, but whether their vital powers are sufficient to overcome this terrible tax upon the nature of their constitution.

Nor is this all. The sheep, though a close biter, is a clean animal; but in the condition in which the soil and turnips have been for the last few weeks, a clean bite has been impossible, and many sheep have suffered and died from irritation and inflammatory action, if not from inflammation of the bowels.

Now the only remedy for this is one which most light-land farmers are utterly incapable of putting into practice: that is, taking off the sheep from the arable land altogether, and carting turnips to the grass, so as to keep the feet free from dirt as much as possible, and the animal as clean as circumstances will admit of. But the light-land farmer wants consolidation and treading as well as the droppings on the soil, or all other crops must be sacrificed, and hence he must more or less run the risk of loss or damage to his stock; and it is a serious question for consideration what he can do to counteract the effects of such unfavourable weather.

Mr. Mechi would suggest, doubtless, board feeding, and in such a season as this might have something to boast of, which, however, would not be likely to apply in any other. Lord Bathurst would claim a vast superiority for his stall-feeding of sheep under these circumstances; and it may be safely granted that shelter from wet is an important consideration; but these cannot be put into practice with any degree of advantage to the flockmaster in general.

The farmer's first object is clearly to keep the animals *alive*—this is a question antecedent to all *profit*.

There can be no doubt but the slicing of the turnips and feeding in troughs is one of the best modes of clean and so far healthy feeding. It not only saves labour in mastication and search for their food, but preserves it free from the aroma of the exudations of the skin and the fecal matter of the animal, and may be expected to be far more free from sand than those which are trodden upon

and fouled both by the feet and what falls from the animals.

Another precaution is to afford a drier bed. This is not very easy. To erect temporary sheds for large flocks of sheep is out of the question, and to recommend it would be utterly useless; but it is easy to take a few cart-loads of material per day. Straw being a bad conductor of heat will retain much of it in the animals' systems, which the damp earth uncovered will often absorb; while, supplied dry day after day, it will absorb the moisture from their woolly backs, and tend much to preserve them in health.

Another excellent addition is the daily supply of a small quantity of fine dry sweet hay. The beneficial effects of this on the system of the animals, especially the stomach, consist in affording the bitter principle, and so supplying the means of healthy action in the animals' internal assimilative organs.

Upon the same principle *salt* is a valuable addition. It is a question whether salt at all assists the animal to fatten; but as the question is how shall they *live*, and not how rapidly they shall *fatten*, it becomes an imperative condiment. Some may die after all; but it is a precaution by no means unwise to adopt, in relation to the trying effects of the atmosphere.

There are, doubtless, cases where the salt is

found to have no beneficial tendency, especially when added to the food. This is not what we intend. The rock salt, if covered over by a slight roof to protect it from the dropping rain, is by no means a bad mode of affording this material; and it has at least this recommendation, that the animals can take or reject it as they choose, and thus have that supply which nature instinctively demands. In a state of wildness the Angola, or wild sheep, excavates the earth to a considerable depth to obtain it; as does the antelope, who visits the salt springs to search for it, and to feed on its saline herbage.

The North American animals are kept in a state of domestication almost exclusively by the use of salt, for they will be tamed by a supply of that material more than by all other processes together.

Moreover, in very wet weather the sheep may be temporarily removed from the arable land altogether, and have afforded to them a night's comfort on the old grass. This will at least invigorate them, and enable them the better to resist the evil influences of such a season as the present.

Possibly the half corrupt state of some of the turnips will but assist the injurious effects of the rain; and we know of no mode so likely to obviate that injury also, as the supply *ad libitum* of a quantity of salt.

## LONDON FARMER'S CLUB.

### THE ECONOMY OF FARMING.

The usual monthly meeting took place on Tuesday, Dec. 10, at the Club Rooms, Bridge-street, Blackfriars—Mr. W. Bennett in the chair. Subject for discussion, "The Economy of Farming."

The CHAIRMAN, in opening the proceedings, said the subject they were about to enter upon derived additional importance from the fact that farmers were now thrown upon their own resources (Hear, hear). In such a state of things it was most important that they should obtain as much information as possible, and he had no doubt the question would be discussed with that calmness and propriety which had always characterized their proceedings.

Mr. BAKER, of Writtle, then rose to introduce the subject. He said:—

The economy of farming consists of the well-ordering and arranging the proceedings of farm management, or, in other words, the doing everything at the proper time and in the proper manner; the carrying out every proceeding and operation with the strictest economy to ensure success; and the adopting and applying every new discovery that will affect the better management of the farm, and will conduce to the greatest return at the least risk and outlay. The farmer who cultivates to obtain a livelihood and profit by his occupation, ought to combine intelligence, activity, and perseverance. On

his practical experience will his success be based. His intelligence will enable him to select and apply experiments in farming with caution and sagacity. With these qualifications and a love of his profession, aided by the assistance of sufficient capital, he will hardly fail of success. But as the first power of a machine puts the whole machinery in motion, so it must ever be with the farmer who undertakes the carrying out of the details of agriculture. Upon the amount of power will depend the velocity; upon the velocity will depend the amount of labour executed; and upon the execution of that labour in a judicious and able manner, will depend the result—this, however, upon the supposition that all other things are equal. But the farmer has a peculiar material to work upon. What is applied to-day is realized months or years in advance. The effect of climate, weather, and casualties of seasons may accelerate or thwart his endeavours to such an extent as either to elevate him to prosperity or thrust him into adversity. Hence it frequently happens that two persons of similar habits and experience finish their career with very different results. And although it does follow that in proportion as we apply our talents so will be the increase, "God helps them that help themselves" is frequently quoted, or in the words of Tusser—

"Man does his best,  
God gives the rest,"

—yet the cultivator of the soil ought never to forget that it is man who sows, but God who giveth the increase. Without



his blessing it is vain to "rise up early, or to late take rest." The winged messengers of destruction frequently overtake him when he fondly anticipates that his hopes are about to be realized: blight and mildew, fire and hail, murrain and disease, follow in such quick succession, that when, fond man, he thinks his prospect brightening, "a frost, a chilling frost o'crtakes him, and nips them in the bud." It will, therefore, not be out of place at this portion of my address to allude to the necessity of guarding against such visitations as one point of economy deserving especial notice, to say nothing of accident. The blast from heaven or the brand of the incendiary may in one short hour reduce a farmer from opulence to beggary; the destruction from hail and tempest may destroy the harvest of whole districts; and the murrain and pleuro pneumonia among cattle, the rot and small-pox among sheep, or the influenza or furr among horses, may sweep away the whole or part of either description of live stock. And yet, with all this casualty and chance, how few avail themselves of the present opportunities of insurance! The various insurance offices established for that purpose testify, and it is notorious that all those established and open for the insurance of horses, cattle, and sheep, hardly obtain encouragement, although the rates of premium are really low; and in those who have all their capital embarked in such "frail merchandize," it is almost madness to run the risk for a single moment, seeing how much their future position and happiness depend upon the venture. Now, here, I hope, I shall be pardoned if I make a slight digression from that which applies to the economy of farming, to that which comprises the economy of life. Perhaps there is no other class of men, except those who carry on their occupation upon the wide sea, who are really so dependent upon fortune as the farmer. To-day he may be in possession of considerable capital, embarked or floating in the concern in which he is, to all appearance, safely engaged; to-morrow, or in a few years at furthest, all his hopes may be destroyed, all his capital exhausted, and himself and family reduced to beggary or the union-house. Where will then be found the helping hand? Charity, let it be recollected, is cold; and with shame I say it, farmers are not exempt from finding it cold. I have reason to know that powerful, but vain appeals are frequently made, through the medium of the press, to the feelings of the public, in behalf of farmers who have fallen into decay. In a recent instance, when a farmer who was aged had broken a limb, having too a blind daughter, and a wife and children, all dependent upon him, was sold up for arrears of rent and tythe, and became positively destitute of a shilling, a public appeal was made; and, although, the most respectable references were given as to the character of the family, and the application of the funds, the subscriptions were only five in number, consisting of three half-sovereigns and two half-crowns. Ought such things to be, in a highly civilized country, that a class so extensive in numbers, so great in influence, and I had almost said so powerful in wealth, have no barrier interposed betwixt the utmost prosperity or the most abject poverty, when by a small annual contribution from each, such results as I have described might be prevented? Two classes of insurers might be accepted, and two rates of remuneration fixed, to provide against the case of adversity overtaking them or their families, and, without entering into detail, I may say that by the application of £1 per annum from each individual all that is required might be ensured. It will be recollected that some time since a subscription was raised for the purpose of presenting a testimonial of the esteem of the farming classes

towards the Duke of Richmond, and which that nobleman with the utmost generosity recommended the farmers to apply towards the establishment of a fund for the purposes I have alluded to. Will the farmers of England, after such a noble example, suffer themselves still to be pointed at as the most heedless and helpless class in existence, especially when their own comfort and happiness is at stake? So far I have been speaking upon the economy of farming with regard to the well ordering of those things that will ensure the farmer, to a certain extent, against risk and loss. I will now, so far as the limits allowed me will admit, enter upon such points as have been, and are still to a certain extent, mooted points in connection with farming; and in the outset I beg to be understood that I shall treat every subject upon the principles of tenant farming. The point to be considered is, how the farmer may produce the largest return proportionate to the outlay and risk. This is the very germ of the question; and although many persons look upon the whole affair as an experiment, and will argue that in proportion to the outlay will be the return, I deny the proposition *in toto*. I say that in proportion as the outlay is judiciously made will be the return; bearing in mind that in proportion as we endeavour to extract a greater amount of produce from the soil, does the expense become increased, and the risk greater. Nature has set her limits up to a certain point: she may be led, but she can rarely be forced. To produce root crops a soil can scarcely be too rich. To produce grain crops the case may be otherwise, as it is only necessary to produce the crop of such strength that an excess of straw will not endanger success. Upon this disposition of management much depends, and in it really consists the economy of farming. The true object is to produce equally good crops upon every field; and unless this be partially attained, but little profit will be found to result in the end. How frequently do we observe upon large farms that whilst one moiety of the crops yields a fair profit, the other moiety does not meet the expenses incurred in production? This is the point to be obviated, and the first endeavour of the cultivator should be to raise the poorest portion of the occupation to a level with the richest, rather than to throw additional expenditure upon the latter to the entire neglect of the former. Draining is now considered the first operation necessary upon land requiring it. Every one admits its necessity and utility at the same time. Every one weighs the expensiveness of carrying out the operation. In some districts landlords undertake the draining wholly or in part themselves, and treat the cost as an investment; and, indeed, this is the only mode by which it can be carried out most beneficially to both landlord and tenant; for, unless the latter is guarded by a lease, or a provisional agreement to repay him the investment he has made, in proportion as it may be unexhausted at the termination of his occupancy, it will be too much to expect that he will apply it in such a manner as to become beneficial to the extent it deserves. Much has been said about permanent draining. I believe that no such description of draining has ever been, or ever will be, discovered. Such are the contingencies to which the best systems of drainage are exposed, that, however carefully the operation may be performed upon most descriptions of soil, a few years will terminate their utility either altogether or in part. The effect of roots of trees, of various descriptions of vegetables, of several species of plants, of the breakage or disruption of the pipes by injuries from above, or by the force of currents of water below, and by the concretion of substances deposited from the water,

such as silica in combination with iron—the effect of all this is, that the continuance of drains is limited to fewer years than would be given as the purchase value of the land itself; nor ought we to calculate beyond from twenty to thirty years as the probable limit of their duration, where subsoils are of an alternating quality. The application of the means to ensure success must always depend upon these points—the cost of the drainage, the benefit produced, and the duration of the drains; and these are governed also by the cost of the labour and of the materials. It would be useless to carry out deep draining, as it is termed, where the outfalls are limited to a certain depth; and it would be useless to introduce the system of hollow draining by the mole-plough, and ramming the soil upon spongy loams or gravels alternating in beds. The means must be adapted to secure the end at the least outlay, taking all other contingencies into consideration. Upon the chalk clays of Essex, Herts, Suff'k, or Norfolk, the long-established system has been to plough the drain six inches, then to dig twenty-four inches more. These are filled below with wood or brushes suitable, and covered with straw or haulm, at a cost altogether of about 40s. per acre; and these drains, if well executed, are calculated to act well for ten to twenty-eight years. The mole-plough upon these soils is used also with decided advantage, and in many instances, if judiciously executed, will work successfully from six to twelve years, at a cost of only 15s. per acre. In the first instance, the cost per acre per annum will be at the rate of 5s., in the latter 1s. 6d. per acre. These systems, when brought into comparison with pipe, tile, or stone draining, differ largely in amount; the latter at the same distance, viz., six yards, varying from £4 to £6 or even £7 per acre. It must be obvious that a tenant ought not to embark his capital in the expensive modes unless he has the land at a proportionately reduced rent, with a term of sufficient duration to repay him; and without a lease an agreement ought to be made for the repayment of a proportion of the improvement. Next to draining, I will advert to the manuring and restoring the fertility of the soil as it becomes exhausted by crops; and the manufacture of manure is a point deserving of especial attention. Upon the production of a large quantity of manure the success of farming mainly depends, and this cannot be effected unless means are taken of producing it by cattle and sheep upon the farm, or by purchase from external sources. By the assistance of guano, superphosphate of lime, and various artificial manures, large crops of mangold wurzel and Swedish and other turnips may now be obtained; and there is scarcely any description of soil to which they may not be applied with the fullest benefit except in seasons of drought, and even in such soils they may be incorporated some time previously, by turning in the guano with a shallow furrow, and rolling down the land immediately the ammonia becomes fixed, and scarcely any portion of it will be lost. Then, when the time of sowing arrives, the succeeding ploughing will bring the manure within reach of the young plants, with scarcely any hazard of loss. With proper management, large crops of green food for summer, and of roots for winter stall and yard feeding, may be produced; and when it is considered that a single acre of Swede turnips or mangold wurzel will yield more cattle food than treble the quantity of grass land, it will be found equivalent to extending the feeding qualification of the farm, the same as if twice or even thrice the quantity of grass land had been added; the average cost of this extraneous aid will vary from 20s. to 30s. per acre, the ploughings being considered as applying to the preparation for

the successive grain crops. Upon the lighter soils rye is taken before turnips. This may, after manuring, be mown for the fodder of horses early in the spring, and it will supply food for all the teams, as well as other stock, from the middle of April until June, the yield being upon an average about three tons per acre, with an addition of 15 or 20 tons of Swede turnips in the same season. The amount will exceed any of the preceding or succeeding green crops in point of value. The application of these green crops is the next subject for consideration. The feeding a portion of the turnip crop upon the land is always desirable, provided the soil is of a suitable character. The cost of carriage of the manure is saved, and the treading of the land secures every portion of the manure as it becomes deposited by an instant incorporation with the soil, whereby its saline and ammoniacal salts immediately become fixed. Where sheep are fed in yards, layers of earth should be from time to time introduced into the yards, or much of the quality of the manure will be dissipated by evaporation and loss. Care should also be taken to prevent the loss by fermentation, by applying it immediately to the land after removal from the yards. The feeding of oxen and other animals should be carried out so as to enable the food to maintain the stock until grass and other crops may be had in the spring. By cutting the straw and hay into chaff, and mixing bruised or sliced turnips with it, the roots can be more or less economized; and bruised linseed cake, or linseed steeped in cold water, combined with the chaff, may be given. With machines that pluck the roots, the process is better carried out than by slicing them; and the desirableness and benefit of the plan will be at once exhibited by the animals. The mode generally adopted of feeding with roots alone, and then feeding with the dry chaff, is more wasteful and costly; the cattle will eat one-third more of roots, and will not eat the straw chaff in sufficient quantity to benefit them. All ruminating animals require a large quantity of food to fill their stomachs, and the quality of the food is better extracted the longer it is retained—a requirement for which this mode of mixing the food provides. The morning feed should be mixed upon the previous night, and the chaff overlaid with the linseed meal, steeped, as before described, twenty-four hours in cold water, in the proportion of 1½ lbs. of meal for each bullock of 80 stones weight. To this three or four pounds of barley meal should be added, with from two to three bushels of cut or pulled Swede turnips or mangold-wurzel, mixed with the chaff, each per diem, in three feeds. By pursuing this plan, the growing of the bullocks will also be prevented. There are four modes of feeding: first, by covered yards; next, by box-feeding; then, by stall-feeding; and lastly, by open yards, surrounded in part with sheds and walls. The three former modes are expensive, as regards the erection of buildings. The difference is, however, trifling between the two first modes. The manure obtained in this way is less in quantity, but more highly concentrated, and requires to be applied thinly and sparingly. The latter mode presumes that the sheds and buildings are well supplied with water-shoots and under-ground drains for its passing along quickly. The manure made in this way is larger in quantity, but more diluted. Provided the system is well carried out, but little advantage is derived if the cost of the several modes and their advantages are fairly estimated. With highly-concentrated manures it is necessary that an immediate incorporation with the soil should take place. This cannot so well be effected with the manure made under covered buildings, on account of its great consu-

lidation. On the other hand, in open yards the manure at some periods may become too much saturated; and during heavy rains a large proportion of the best quality may be lost. In covered yards the space is generally too limited, and the oxen require to be secured to prevent them from driving each other about. This applies to open yards to a certain extent, but it is entirely obviated by open boxes, where each ox has the space allotted in quiet to himself; and of all the modes it is the one which most recommends itself. Stall-feeding does not allow of the manure being so well incorporated; and proper care should daily be exercised to mix it, as well as that arising from the stables, with the other farm-yard dung. The after-management of manure depends upon the crop to which it is to be applied. If to the production of root crops, just such a degree of fermentation should be excited as merely to decompose the straw by which it is absorbed, without utterly destroying its texture, so as to allow it to be spread easily and to divide readily; and although some loss will take place, it is impossible to render it sufficiently portable without fermentation. The nature of the mangel-wurzel, and all the turnip and Brassica tribe, require decomposed manure, the woody fibre of which is sufficiently broken down to enable them to take it up by their rootlets; and especially with mangel-wurzel, the manure will, if not pretty much reduced, allow the land sufficiently to consolidate to resist the effects of drought during summer. If the manure is carted out for use at a future time, it should be kept as much concentrated as possible by carting heavily upon it, and covering and mixing it with alternate layers of earth; and if of a loamy character, the end sought to be attained will be more fully secured. Inorganic manures form an important item in general farm-management. The quality of every soil depends upon the amount and quality of the various substances of which it is composed. Vegetable matter, alumina (or clay), silica, and calcareous matter form the chief ingredients of all good soils. If any of these are deficient, it will be necessary to add them; and it frequently happens that one portion of a farm contains exactly what is required upon another, and when this is the case, the cultivator has a mine from which he can extract wealth. The siliceous soils of Norfolk were formerly of little utility, and, until the application of marl dug from below upon the surface, produced but little return for the cultivation bestowed. The application of superphosphate of lime or ground bones to the blowing sands of that county produces the finest turnip crops in the kingdom; and the recent improvement made in that application by reducing the bones with sulphuric acid is, perhaps, the greatest triumph that chemistry has effected towards the furtherance of agriculture. The clay found in every direction may be applied beneficially to all lands deficient in that substance. It acts by causing gravelly and sandy soils to become more retentive of moisture, and less impervious to the action of the sun's rays and atmospheric air; but, beyond this, clay has great affinity for ammonia and the volatile substances of manure, which immediately become fixed whenever they are brought into contact. The fens of Lincolnshire, naturally unproductive, are rendered more fertile than almost any other district by digging it from below, and spreading it over the surface in sufficient quantity to combine with the peat soil of which the surface is composed. Calcareous matter in its various forms is partly decomposed shells, carbonate of lime—as chalk, marl, lime—or, in combination with other substances, as chalk, in admixture with clay. Lime is limestone after the action of heat; it comes more or less within

the scope of almost every farmer, and it is such a general fertilizer that it might be used upon almost all soils with advantage, those alone excepted in which it already exists in large proportion. Upon every description of clay, without the previous admixture of carbonate of lime, and upon all alluvial, or peaty soils, it frequently produces improvement to an astonishing extent. But the agriculturist should guard himself against its indiscriminate use; taking it as an established maxim that every description of strong clay that has never had an application will be benefited to a greater extent than those to which previous applications have been made; upon all grass layers converted to tillage it is indispensable, and upon every description of pasture and meadow-lands, in districts where chalk is not prevalent, it will produce great improvement both in the quality and the quantity of grass. Upon the proper admixture of soils also much of good farm-management depends. Where portions of a farm, or even of a field, consist of soils of a directly opposite character, either or both may be benefited by a proper intermixture; and in making composts attention should be always paid to this subject. Another very important item in the cultivation of a farm is the manual and horse labour. Upon most farms it amounts to upwards of two-fifths of the entire cost of cultivation, and the cost of maintaining a horse differs little in amount from the cost of employing an able-bodied labourer throughout the year; and when it is considered that every 100 acres require about two men and horses in the aggregate for their cultivation, the importance of the subject will be too self-evident to be passed over lightly, amounting as it does to a sum varying from £250 to £300 upon an average upon each 100 acres of arable land. The system pursued by farmers in this respect is one which, of all others, is least likely to be attended with benefit. For the most part, when labourers are kept at day-labour they lose all disposition to exert themselves, and many of them take every opportunity to rest themselves and defraud their employers. For this reason no system will be found so beneficial as piece-work, provided proper vigilance is exerted upon the part of the employer to prevent the workman executing his work in a slovenly, hasty, or improper manner. To well arrange this, the first essential is order; and the next a thorough knowledge on the part of the employer of what amount ought to be paid for the various services performed. The hours of labour should be fixed, and adhered to. From half-past five in the morning until half-past five in the evening, when the light would allow, would perhaps, under all circumstances, be the proper hours for working. Those who have the teams to attend to would require to be at least one hour earlier and later in attendance; and all those not engaged with horses should commence and finish their meals at the same time. Another very important point is to concentrate the labourers upon a particular portion of the farm. It is better to complete a portion of labour off-hand than to have a number of labourers at an equal number of employments. Above all things, just and upright conduct on the part of the master is indispensably necessary towards the honesty, energy, and conduct of the labourer. If work is put out, and the labourer raises a sum beyond what the farmer considers would meet the occasion, and he reduces the price or deprives the labourer of the opportunity he has obtained of earning a sum beyond his daily payment, depend upon it eventually he will pay a larger sum for his labour than if he had liberally paid what he had agreed upon in the first instance. If a labourer finds that

his exertions are not compensated, he will take care upon future occasions to cheat his employer and wrong himself rather than submit to have his labour unrequited. Upon the example of the master the conduct of the labourer depends. An adherence to the principles of morality and justice, with a proper and kind deportment at all times from the master to the men, will ensure their regard; whilst, on the other hand, honesty, sobriety, and punctuality should be insisted upon, and any departure from either should be attended with dismissal or punishment. With regard to the management of horses, the expense of maintaining an inefficient team is greater than that of maintaining one fully equal to the work. Horses should be purchased from two to five years old; the cost of horses advanced in age beyond eight or ten years is much greater proportionately than of those that are younger. A horse may be supposed to be able to work upon an average from 12 to 14 years; consequently, if his value at three years is £30, at ten years he would only be worth £15; but at that age he generally produces two-thirds of his original cost, or £20. By introducing a pair of two or three years old colts per annum, where fourteen horses are kept, the stock will be kept up. The risk and hazard depend greatly upon the feeding and management. Horses well and sufficiently fed will wear longer than those that are ill attended to. Cart-horses should have cool, well-lighted, and ventilated stables, and covered yards or sheds at night. If possible, they should be kept apart; but if this cannot be accomplished, only those should be kept together that agree. Their food and work should be regular; irregularity in either being injurious to them. The food required by a working horse is about 40lbs. per diem, of which from 10lbs. to 12lbs. should be sweet oats mixed with cut chaff, clover, and straw, in equal portions. Upon very strong soils some beans might be added; but, whatever mode of feeding is adopted, it should be at all times sufficient to keep the horses in a sleek and healthy appearance, and good condition. It is not necessary that the bones of the ribs should be hidden; but the nearer the approach to that state is carried out the better. During winter some vegetable food should at all times be given; and when the laborious portions of the wheat and spring-seed times are over, carrots, Swede turnips, and potatoes may form a large proportion of their food. In spring the approach of the time for feeding on green food should be guarded, by admixture of early-cut rye, clover, or vetches with the dry food upon which the horses have subsisted during the winter months. Such green roots and leaves may be combined with the dry food, and cut into chaff, with great benefit; and so in the autumn, when the transition takes place from green to dry food. Another main point conducive to the health of the cart-horse is the insisting upon their coming home to some sheltered place during the time of the mid-day; but if a horse is at work at six o'clock it will be requisite that at ten o'clock he should rest one hour, when he should be well fed and watered. He should proceed again until three o'clock, at which time his labour should conclude. The improvident mode of allowing the ploughman to take provender into the field cannot be too greatly condemned; for most of the diseases of an inflammatory nature are to be traced to this source. How can it be otherwise when a horse is stopped at plough, and suffered to be exposed to the cutting winds of April or March for the greater portion of one hour, without any shelter whatever? I made some inquiries, and obtained answers, upon the management of farm horses, as carried out in most of the English counties; and

the opinion I come to as best, after weighing all those that I received, is what I have already stated. The system pursued, however, is exceedingly various. In the Lothians and some parts of Norfolk and other counties the horses rest from eleven o'clock until one o'clock; in other districts they do not stop at all from six o'clock until two o'clock; but in most districts the time of rest is half an hour in the fields. To all these modes I object. In the first place the stomach of the horse does not qualify him for seven or eight hours' incessant labour. His strength requires recruiting about every four hours; and the old maxim of feed well your horse as often as you require food yourself is pretty nearly the correct method to be adopted. But of all systems, that is most to be condemned which exposes the horse unnecessarily to the action of cold currents of air after the blood has been excited and unusually heated. The next great division of expenditure is that which includes the sums paid to the smith, wheeler, and farrier, and for the repairs of the farm, which are frequently, especially in the southern and eastern counties, imposed upon the tenants, who are bound not only by custom, but by covenants, to keep and maintain the premises in repair. Upon these points I have little to urge beyond the propriety of keeping weekly accounts of every item of expenditure where tradesmen are employed; but where the farm is of sufficient magnitude a smithy would be found a desirable and economical addition; and if a man can be found to fill the situation of wheeler and carpenter, another important and beneficial addition will have been made. In connection with this subject I shall briefly advert to a source of expenditure connected with the southern and eastern counties, viz, that of fuding the labourers ale during all extraordinary employments, and table beer at all other seasons. At times every labourer requires the luxury of the beverage of his country in the shape of good home-brewed beer, but this the tax on malt almost precludes his obtaining. The enormous tax imposed upon malted barley had almost precluded the use of that article upon farms, except during the period of harvest; and the high price of beer arising from the monopoly, and from the circumstance of the tax upon it being imposed in the first stage of manufacture, enhances the price to the consumer at least 200 per cent.; or, in other words, beer that costs only 8d. per gallon is charged to the consumer 20l. But independently of this exaction both from monopoly and taxation, the farmer is entirely precluded selling his second-rate class of barley for purposes of malting; and it frequently happens that barley only 6lb. in weight lighter than other barley sold from 15 to 20 per cent. less in consequence. Nor can the agriculturist avail himself of the opportunity enjoyed by the foreigner, of malting his barley for the purpose of feeding cattle, or for the support of his workmen, who toil in its production. "Thou shalt not muzzle the ox that treadeth out the corn" is a proverb that has reached us from earliest antiquity; yet the common beverage of the people of this country is so highly taxed that scarcely anything like it is to be found in this or any other country. If the tax remains in whole or part, all restrictions should be removed from the sale of beer, and none but the licensed victuallers ought to be allowed to sell it to be drunk upon the premises. The enormous number of beer houses that have been established in every village have tended to demoralize the labouring classes, whilst the ruinous effects upon the houses of the licensed victuallers have reduced the profits of their business to such an extent that travellers in vain ask the accommodation they were wont to

obtain, and are entitled to expect upon every farm where the custom alluded to prevails. The tax upon malt alone is equivalent to one shilling per acre; and, in my opinion, a greater anomaly never existed than that of removing nearly every portion of the tax from bread, and imposing a tax of from eighty to ninety per cent. upon malt—both equally necessities of life. The personal expenses of the farmer are especially deserving of attention; for, as his means are more or less limited, so must his command of the comforts and necessities of life be more or less diminished. The thrift of farmers, however, in most districts is proverbial, and is carried out to an extent that few who have not experienced it would believe. I could give numerous instances in which the whole expenditure of a farmer living upon his own farm worth £150 per annum does not exceed half that sum, and frequently a much less sum is devoted to that purpose; and although it may it be too true, that the economy necessary to the farmer's well-doing is exceeded, it has now become rather the exception than the rule. The expenditure consequent upon cultivation has now been treated upon generally; but, as production is the foundation of expenditure, I shall briefly state a few leading points upon the nodes of production pursued and most worthy of our acceptance. Science has of late unfolded her pages for our instruction; and foremost we rank chemistry, natural physiology, geology, and mechanics. The first not only teaches us what are the constituent properties of plants, but opens to our view the elementary substances of which soils are composed, by which vegetables are supported, and the rotation of crops is most beneficially carried out. So wide a field opens for discussion, that I feel it impossible to limit my observations within the ordinary space of time allotted to these discussions. I do not feel disposed to occupy the time of others to the extent of the Chancellor of the Exchequer (laughter), even had I the astonishing ability of entertaining you for the same length of time. But there are still topics untouched upon, in this interesting subject, which I cannot entirely pass over without comment. The nature of ordinary farming is prescribed by covenants or fixed by custom, both of which are more or less trammels on the enterprising cultivator, and whilst they bind the bad farmers, materially injure the good. The proper rotation of cropping must depend upon several causes alike distinct and different in different situations, including the elevation and quality of the soil, so that no general rule can be laid down for different districts; nor can the same plan be applied even to adjoining farms. The cultivator should first determine to what extent roots and grass crops can be applied advantageously in connection with green crops; and this will depend upon the locality and quality of the soil, as well as the convenience of application. It is matter for consideration how far the land can be brought into and maintained in cultivation for the production of green crops, on the assumption that present prices are to govern for a succession of years. It will be useless to carry on the cultivation of green crops upon the poorer lands if the expenses of such cultivation cannot be realized. Land incapable of producing more than 22 bushels of wheat and 32 of barley or oats cannot, under ordinary circumstances, be cultivated at a profit, independently of rent; and therefore in all such cases the cultivator should determine to lay them down in grass, to be fed with cattle and sheep until a chance of remuneration opens to him. The cultivation of the remainder must be adapted to the quality of the soil; and, if of a quality suitable for feeding sheep during winter upon the root crops, it is pre-

sumed that no more profitable application can be made; and the direct incorporation which took place by the treading of the sheep, from constantly fixing the deposits of the sheep, will enable a larger amount of surface to be manured than could be effected by yard feeding. If, on the other hand, the land is of too tenacious a character to bear the sheep during the process of feeding, the mode recommended of yard feeding must be resorted to. Whenever the land can be made available for the growth of roots, at least one-fourth should be applied annually to their production; and upon farms requiring improvement, the largest portion should be produced from the application of artificial manure. Upon a farm well managed every 100 acres of arable land should have 33 devoted to crops of clover. Vetches, rye, and food for summer feeding cattle and sheep, to be succeeded by the common or swede turnips; as well as by mangel wurzel from the commencement. The advantages to be derived will be, first, a great quantity of summer and winter cattle food from the same land; secondly, a larger quantity of grain by the improved rotation; and, thirdly, a progressive improvement of the whole farm. This management will enable the cultivator to carry oxen 1,100 weeks to every 25 acres so cultivated during the winter months; for, assuming the average produce of the roots to be 15 tons per acre, and that each ton will feed an ox three weeks, every acre will yield food for 45 weeks; and the 25 acres will permit a productive power equivalent to 1,125 weeks' keep, or 11 weeks' keep on each acre of arable land for a full-grown ox; and upon the ordinary calculation of one ton of roots for the production of one stone of meat, the net return of the roots with meat at 4s. per stone will be equal to 3l. feeding value; but in connection with the other food, that, however, would be increased 25 per cent., leaving the net feeding value at 4l. per acre upon the land in roots, or 1l. per acre as the gross feeding value upon each acre of the farm. This increase will be independent of the sum to be derived by the amount of feeding value for the summer production estimated at one-third of that amount. There will of course be much increased expenditure upon a farm so managed, both as regards the cost of producing the root crops, and their conversion into meat; and the cost of the artificial manure will also have to be deducted. I have entered upon this calculation in order to exhibit the advantage of cultivating root crops, as opposed to maintaining whole districts in grass. Assuming that one hundred acres of grass land would feed as many oxen through the year, we then have 1735 weeks only as the result, against 1125 weeks upon the same quantity of land, one half of which would be in green crops; and taking the feeding value of the clover and vetches into consideration, it will then appear that the arable land will maintain the larger number of cattle throughout the year. I know that different cultivators will imagine a different result; but my object is to show that the economy of farming does not consist in keeping a large number of cattle and sheep upon grass land entirely devoted to that purpose, but rather in producing a large quantity of corn, and a large quantity of meat also, upon the same land. In the cultivation of grass land little remains for the labourer or even the grazier to effect. There is more in the exercise of judgment in the selection, management and sale of the cattle and sheep, than in the management of the land; but in the cultivation of land of a mixed character every talent should be brought into play to enable the manager to succeed. In the production of green crops the main object should never be lost

sig't of—to obtain the largest quantity of the finest quality at the least expense. The arcanæ of the science are contained in this sentence; and although a large outlay sometimes yields a corresponding return of profit, it more generally happens that the profit attendant upon an extraordinary application of capital is more than counterbalanced by the risk incurred, and the deficiency of energy exercised, or skill developed, in securing the object. It is a notorious fact, that, just in proportion as increased production is sought to be attained by extraordinary cultivation, so inversely does the risk become greater. Nature may be assisted in her efforts, but if she is forced, the danger increases with the stimulus. Upon highly cultivated farms, in seasons like the present, the application of manure in quantity barely sufficient in a dry season would be utterly destructive of the green crops. The object of the farmer should be to avail himself of every opportunity of collecting to the homestead as much hay and clover during the summer as may be made available for winter use. An acre of broad-leaf or red clover, if mown twice, will yield from three to four tons per acre, of from 50s. to 60s. feeding value per ton; whereupon, on the other hand, if fed with horses and sheep, it is difficult to obtain more than one third of that value per acre; and, in addition, the quantity of manure that can be produced from it as hay is infinitely greater than could have been produced by feeding during the summer months upon the land. The situation of France has of late years become of increasing importance. The vicinity of towns, railways, canals, and good roads give facilities of improvement that a cultivator in a remote district is unable to estimate. In remote districts, with bad roads, a large portion of horse-labour is of necessity sacrificed, and work that might have been advanced is retarded to such an extent as to call for the assistance of the teams when they are absolutely requisite in other departments of the farm. Every possible attention is requisite for keeping all the horses employed whenever an opportunity presents itself. The time of horses is rarely estimated at the same rate and upon the same principle as the time of man. This arises from the one being repurchased weekly by a money-payment, and the other going on from the beginning to the end of the year without any intermission. So little is the importance of this portion of farm economy attended to, that horses are frequently turned off during the summer for many weeks, to enable the horsekeepers to assist in other descriptions of farming work; and upon very many farms the operation of the plough is suspended entirely during the month of harvest—a season when its application would become more valuable than any other portion of the year. The present state of the law of landlord and tenant is destructive of that proper and gradual improvement of the soil that would take place under a well-regulated arrangement. So long as tenants are subject to the caprice of landlords under yearly hiring, without the possibility of being repaid any portion of the outlay made for improvements, it would seem strange if there were any improvements at all; much more if heavy investments were made without any security beyond that which an ordinary occupation gives with six months' notice for its determination. As regards farm-buildings, and other erections which a tenant might require to enable him to realise his produce with greater advantage, he must resign them altogether, or be contented with the risk under which he retains them. But let us hope that the policy of the present Government, as declared by the Chancellor of the Exchequer a few nights since, will, if carried out, strike at

the root of every description of unjust or unfair legislation and that the law of landlord and tenant, as carried out in that period of our history when the one party were tyrants and the other slaves, will not be perpetuated in these days of advancement and civilization. If one thing be less understood in its results than another, it is that which constitutes the profit or loss of farming; and during the late controversy, arising from the alteration of the corn laws, it is matter of astonishment that such a discrepancy in the various published opinions should have existed. It is to be lamented that no system exists in our ordinary schools, of teaching the youth destined for an agricultural life the mere data of good farming. Even afterwards, in very few instances, is any system of management propounded beyond that which a routine carried out upon particular farms would ensure; and when we reflect upon the errors in practice which are to be seen in every direction, there is little cause to wonder why the progress of farming has been so tardy. [Mr. Baker concluded amidst loud applause]

Mr. NESBIT said, as no other gentleman seemed at present disposed to rise, he would make one or two observations relative to the use of artificial manures. They were probably aware that in the hilly districts of this country the application of such manures had been exceedingly beneficial; and the cheaper they could be obtained the better would it be for the farmer. The adoption of Liebig's suggestion of the use of sulphuric acid with bones and other phosphates, in order to render them soluble, and therefore available by plants, was the first practical application of chemistry to agriculture; the mixture of two or three bushels of bones with an equivalent quantity of sulphuric acid, enabling farmers to secure good turnip crops. In cases in which land had long been suffering from exportation, there was often a deficiency of phosphates; but many races of animals having lived before those which now existed, there were found in many counties millions of tons of fossil remains, which had only to be dug up and acted upon by sulphuric acid to supply what was wanted; and these fossils might be had much cheaper than ordinary bones, because they were more plentiful. Now, the Royal Agricultural Society had, on the motion of Mr. Fisher Hobbs, recently offered a prize of £1,000 to any person who could discover a manure which could be sold at £5 per ton, and which should be at the same time equal in value to Peruvian guano. The object of the society in making that offer was to lower the price of the article; and what he wanted to point out was, that while there were many millions of tons of these coprolites in the soil, forming a manure which would be exceedingly valuable for all root crops, and while the society was offering the reward which he had mentioned, there was in the council of the society a gentleman who had attempted to prevent any one from using these substances without his permission, and who was actually bringing an action against a party for using sulphuric acid with coprolites (Hear, hear). There was nothing new in the supposed discovery; Liebig suggested it many years ago.

Mr. WALTON said many of Mr. Baker's remarks were inapplicable to the county in which he lived, viz., Hampshire. In that county it was almost useless for

farmers to attempt making improvements, owing to the want of adequate buildings; and he believed that three-fourths of the farmers of England were subject to the disadvantage. It was impossible to carry dung two or three miles—the distance which he had to carry it profitably; and no man would make improvements himself without due security. In the *Mark Lane Express* of the previous week he perceived an announcement that Mr. Crosskill had invented a machine of eight-horse-power and four-horse-power for grinding coprolite bones, obviating the necessity for using sulphuric acid. He should certainly buy one for himself, being satisfied that bone-dust, if reduced to a very fine state, was far preferable to dissolved bones. He quite agreed with Mr. Nesbit that the use of sulphuric acid with fossils was the first application of chemistry to agriculture; he would go farther, and say it was the only one (laughter). As to the want of improvements in farming, it was chargeable upon landlords who would not grant leases or any kind of security.

Mr. S. BENNETT said, as it appeared now to be a settled point that they were only to have a very moderate price for what they produced, he had hoped that Mr. Baker had some new scheme or other by which they might cultivate the land at a smaller expense, and so be enabled to live, notwithstanding the bad times. (Hear, hear.) Mr. Baker, however, appeared to have thought that any such attempt would be futile; and he had therefore adhered to sound principles of economy, in connection with good farming and prudent management. Conceiving that nothing could be out of place on that occasion which had to do with “the economy of farming,” he would ask the meeting whether that was not a time for them to take some step with regard to the malt tax. (Hear, hear.) At a period when the subject had been mooted in the House of Commons, and when they had been offered, or rather the public at large had been offered, half the tax, which was a considerable boon, though he would have liked better to have the whole of it—(Hear, hear)—at a period, too, when the Chancellor of the Exchequer had admitted that the farming interest was in a very bad state in comparison with any other interest in the country—at such a period he really thought the farmers should go to the Chancellor of the Exchequer and ask for a drawback on the malt which they used in agriculture—(cheers)—and in his opinion they ought to take some step with that view before separating. There might be some little difficulty in allowing a drawback in the case of malt used for agricultural purposes, but it was not insurmountable; and if the Government really meant to assist them, why not ask them to do so in a manner in which the assistance would be of so much use to them? (Hear, hear.) He hoped they would all be united on the subject; and if they were, he thought they would be able to accomplish the object. He knew there were some who said that there was as much fattening power in barley as in malt. Admitting that, he might still say that animals had not the same inducement to eat barley as to eat malt. (Hear, hear.) Malt

sweetened everything that was given to them—(Hear, hear)—and was conducive both to health and growth.

Mr. BIDEELL spoke strongly in favour of the adoption of covered homestalls. He had paid much attention to the subject, and he was perfectly satisfied they were not more expensive than a set of farm buildings erected on the old-fashioned plan. As much manure was to be made in the covered homestalls as in the open yard, and if they tied their beasts up three times a day for the purpose of feeding, it would be found that they quarrelled less in a covered than in an open yard. This he stated as the result of his own personal experience. Then if the other improvements which belonged to covered homestalls were taken into consideration—namely, the greater warmth they afforded to the stock, and the protection they gave against bad weather—he thought he might say that that description of homestalls was quite consistent with true economy in farming. His friend Mr. Baker had showed that no improvement could be adopted in agriculture without increasing the risk, and that position he (Mr. Biddell) did not dispute. There could be no doubt, if a man resorted to expensive modes of farming, his risk was thereby increased—that no step could be taken in the way of improvement, without some additional risk. He had yet to learn, however, that it might not be consistent with true economy and prudence to take a more liberal view and farm better, even if by so doing they incurred a larger expense. (Hear, hear.)

Mr. R. SMITH said the question of the economy of farming was of great importance to them all, and he was confident that every one who was present whilst the paper of Mr. Baker was being read, would be deeply thankful to that gentleman for the extensive information he had been the means of imparting upon this subject. The economy of farming embraced a variety of matter, all of which were of paramount interest to the farmer. And he had no doubt whatever that, if they were in future to be enabled to grapple with the times, they must devote more of their attention than they had hitherto done to such questions as the growth of root crops, the application of artificial and other manure to the soil, the purchase of implements, and the building of covered sheds and stalls. He trusted, therefore, that they would let the past go as the past, and that from the present moment a new era might be dated of progress and improvement in the history of the agriculture of England. The oldest and the best of them might always learn something in the school of science, and from the experience and skill of other men. In the remarks of Mr. Baker, with respect to manual and horse labour, he perfectly concurred. They might depend upon it that every idle horse represented an idle man; and that, if ever they found a horse standing idle, they would be sure to find an idle labourer not far off. Care and attention in the employment of their horses were consequently essential requisites upon every farm. Mr. Baker had made frequent reference to the subject of growing rye for spring purposes. Now, as a profitable food to the farmer, he (Mr. Smith) would name a cropping which he had found exceedingly applicable to the climate. It was a convenient course, though not a new one; for he remembered that 20 years ago his father practised it in Lincolnshire. Under the modern system of high farming, they might rely upon it that they would have to turn their attention a little more from corn to stock; and if to sheep farming, they would find that they must use an abundance of manure, keep their lands in the highest state of cultivation, and take their root crops first. He would first sow the land with

turnips, and the following year seed it with rape, to be fed off by the sheep. Having done that, about the end of October let the land be shut up, after sowing it with Italian ryegrass and timothy, and the result would be a supply of food for the spring which nothing could surpass. With regard to carting manure long distances on the farm, according to the present system, half the occupation of their horses was to carry corn home on the one hand, and to carry out muck on the other. His advice was, that the artificial manures being more compact and concentrated, should be carried to a distance, and the farmyard manure kept nearer home. Upon the subject of the prize of 1000*l.* offered by the Royal Agricultural Society for a manure which would compete favourably with Peruvian guano, as a result of that offer he was happy to state that letters had been received from various parties connected with the guano trade—and from one eminent firm in particular—to the effect that they would consent to lower the price of guano to the public by 2*l.* a ton rather than that such a manure should be supplied (Hear hear).

Mr. S. BAKER.—Would Mr. Smith tell them what was his rotation when he had taken his ryegrass and rape for the fallow crop?

Mr. SMITH.—With the four-field course, the old system was to take the crops in this order: turnips, barley, seeds, and wheat. His plan would be turnips, then seeds, next wheat, and finish with barley. But the five-field course was the more convenient one, and this he took as follows: 1st, turnips; 2nd, seeds and rape; 3rd, seeds again; 4th, wheat; and 5th, barley to finish.

The CHAIRMAN (Mr. W. Bennett) said he agreed with Mr. Baker that a vast degree of useless toil was imposed upon farm-horses, and that they were made to perform too long journeys without feeding. He did not see, however, that it was possible to feed them more than once during the day. A plan which he had found to be highly advantageous, was to bait the animals about 11 or 12 o'clock, according to the character of the season, whether busy or otherwise.

Mr. BAKER had recommended one stoppage as being necessary, from 10 to 11 o'clock in the forenoon.

The CHAIRMAN: To give the horses a bait about the middle of the day was an exceedingly good practice; to work them hard until three or four in the afternoon, was to kill them by inches; but to give them a little water and a bait in the interval was good husbandry (Hear). The question to which his excellent brother (Mr. T. Bennett) had referred, he (the Chairman) did not consider to be at all out of place in a discussion upon the economy of farming, particularly as at that moment it was under the consideration of the legislature. They no doubt all of them concurred with him in the opinion that the moment they were called upon to compete with the whole world as regarded the introduction of foreign agricultural produce in the English market, that moment the malt tax ought to have been entirely and for ever abandoned (cheers). For under such circumstances it was totally unfair to prevent a man from using the produce of his own farm as freely as his own or his horse's labour. The farmer grew the barley, and his labourers cut it down and thrashed it out; but before he dared use it in the shape in which it would be most advantageously used, the excise officer came in, made his dip, and by virtue of that operation enhanced its cost to the farmers in that shape as much again as it was originally. Now, he contended that the power of the agriculturists of England ought to have been sufficient to force any Minister of the Crown, whoever he might be, to repeal the whole of this obnoxious and oppressive tax, especially if in future the principle of "unrestricted com-

petition" was to be carried out in every other department of their pursuits (Hear). In the proposition of the Chancellor of the Exchequer recently put before Parliament there was one point of serious moment to them—that was, the period from which the reduction was to take place. In all the markets of England barley was in a depressed state. In Mark-lane, on Monday, it went down, whilst wheat went up; and he believed, if the Chancellor of the Exchequer's plan of taking off half the duty in October, and allowing a drawback on the stock of malt then in hand, were carried into effect, they would see the price of barley lower still; for every brewer would take care that he had not a single barrel of beer on hand more than he required for the supply of the ordinary demand until the period when the duty came off. Thus they might expect a further depression in the sale of barley for the next three or four months; and the plan of the Government would, consequently, at first, do harm instead of good. His opinion was that it would be better to remit the duty from the 1st of January next, and leave the parties who had stocks on hand to deal with them as best they might. True, the Government would lose a small amount of revenue by adopting that course; but, as a set-off, the farmer would get a better price for his produce.

Mr. BAKER then replied, and in reference to what had fallen from Mr. Biddell upon the subject of covered homesteads, explained that he had not put the covered homestead in competition with box feeding; he had merely stated that, of the two, box feeding was preferable for the advancement of the animal, though it was the most expensive. But he quite agreed, that if he could, he would have all covered homesteads. The difficulty was, however, that the landlord could not be induced to improve the homesteads at his own expense. (Hear, hear.) He concurred with Mr. Smith in the opinion that the more they brought root crops into their cultivation, the more corn they would be likely to grow, and the greater profit obtain. With regard to the malt tax, the observations of his friend Mr. Bennett were most pertinent, and he agreed with him that, if the contemplated scheme were carried out, it would have a material effect in depreciating the value of barley for some months to come. If the drawback were to take place in October, no brewer would brew more than was absolutely necessary to meet the ordinary demand, and would keep his stock at the lowest possible point. Moreover, in his (Mr. Baker's) judgment, the drawback should be allowed on all beer brewed from malt between this time and the 1st of October, as well as upon the malt itself. (Hear, hear.)

The following resolution was then unanimously adopted:— "That it is the opinion of this meeting that the economy of farming may be greatly promoted by discreet attention to the successful employment of the manual and horse labour of the farm; also by giving the utmost facility for producing an increased quantity of manure, which would be greatly promoted by landlords furnishing good and convenient farm homesteads, and most of all by giving security to the tenant that such improvements in farming may be available to his own benefit, and that of his family."

A vote of thanks to Mr. Baker for his lecture, and to Mr. Bennett for presiding, terminated the proceedings.

## LONDON FARMER'S CLUB. THE ANNUAL DINNER.

The annual dinner took place, on Thursday evening, Dec. 10, at Radley's Hotel, Bridge-street. Mr. Ramsay, of Derwent, Newcastle-on-Tyne, was in the chair; and



amongst the company were Mr. Baker, of Writtle, Mr. W. F. Hobbs, Mr. R. Smith, Mr. Cuthbert Johnson, Mr. Hudson, of Castle Acre, Mr. Jonas Webb, Mr. T. Davey, Mr. Buckley, Mr. H. Overman, Mr. W. Bennett, &c. The dinner itself was worthy of the reputation of the spirited landlord, Mr. Holt.

After the loyal and national toasts had been dissolved of,

The CHAIRMAN said the next toast which he had to propose was what was termed the toast of the evening—"Success to the London Farmers' Club" (cheers). They were all so deeply interested in that toast, that it could not be otherwise than perfectly acceptable. In looking at the progress which the club had made during the past year, it was impossible not to observe what important subjects had been brought under consideration. The benefit of the discussions was not confined to themselves, but the other farmers' clubs in the country were led to follow the example of the London Farmers' Club (Hear, hear). In glancing at the important topics which had been discussed, he could not help singling out the repeal of the malt-tax, which was very forcibly introduced by his friend on his right (Mr. Fisher Hobbs) and responded to generally by the club, which felt that the legislature was bound to attend to the just demands of the farmer by relieving him from the malt-tax; and without trenching upon politics, he might observe that the efforts of the club in connection with that question appeared to have produced beneficial effects. Another question—it was introduced by their friend Mr. Shaw—was that of tenant-right (Hear, hear). There could be no doubt that something was required to place landlord and tenant in a better relative position; and whether the plan laid down in the paper read by one of their most valuable members was the proper one or not, unquestionably some plan was needed which would meet the wants and wishes of agriculturists on that subject. Another question of great importance to agriculturists was the settlement of the poor-law question. On that subject they had had some excellent papers, and one in particular from Mr. Gordon. Mr. Chadwick also had assisted in the discussion with information obtained by him as Secretary to the Poor-law Commission. The whole subject was one of great national as well as agricultural interest; and, for his own part, he would remark that when the fever of politics had died out, the question would be settled by the adoption of a national rate. It was, he conceived, of great importance that such subjects as those should be duly discussed by intelligent farmers; for it was hardly possible that discussion should not tend to the removal of difficulties, and to a satisfactory settlement. No one present probably deny that chemistry had done a great deal for agriculture. He believed there was scarcely any person now, who professed to be a good farmer, without having some chemical rules to guide him. The time was gone by when they were contented to guess at everything. It was now considered necessary to have the aid of chemical science in order to bring crops to the best condition, and to enable the land to meet the various requirements of the times. Chemistry had, he thought, within the last few years done more for agriculture than

anything else. Formerly agriculturist could proceed slowly; but now, so great was the struggle for a livelihood, that no portion of her Majesty's subjects were called upon to make greater exertions. (Hear, hear). It was not to be expected that every farmer should himself be a chemist; but they had chemists to advise and assist them, and amongst these he could not help mentioning their excellent friend Mr. Nesbit. (Cheers). The question of "the economy of farming" had been introduced by a gentleman on his left (Mr. Baker), who had contributed greatly to the instruction of the club, and to whom the club was much indebted for his excellent remarks. (Hear, hear). The subjects which had been discussed were so various that it would be impossible for him to notice all of them; there was not time to do so, and he would only remark generally that the questions discussed were of the deepest practical importance. He considered the "London Farmers' Club" one of the most important bodies in the kingdom. From it everything useful emanated; and he regretted that farmers had not joined it in larger numbers, feeling confident that the details entered into, and the information given, combined with the smallness of the subscription, made it one of the cheapest and best means of obtaining information placed within the reach of agriculturists (Hear, hear). There was perhaps less difference than there had been for some time back with regard to some great questions which had agitated the public mind, and which were now partially settled; there was less contention among the agricultural community on those points; and they must now set their shoulders to the wheel, and endeavour by industry, by talent, and by every means which they could possibly bring to bear upon the matter—when those things to which he had referred were passed away they must endeavour to pay more attention to the working out of the agricultural system, and the placing it on a sound and rational basis. All other trades and manufactures in this country were made prosperous by great efforts. It was not for them to quarrel about what was past, but to look forward to the future; and he believed that if they followed his advice in the matter they would soon improve their position, and in a few years would have no more reason to complain than other portions of Her Majesty's subjects (cheers). It would ill become him to detain them long; but the club having done him the honour to place him in the chair, he thought it his duty to point out, as well as his humble abilities enabled him to do so, the leading principles which in his judgment ought to guide the club in future (Hear, hear). He thought there was sufficient talent, sufficient energy, and sufficient good-will among the farmers of England to maintain the position which they had always occupied, that of the first agriculturists in the world (cheers). A great deal had been done, but a great deal also remained to be done; and he must say that while they talked about large crops of wheat, fat cattle, and so on, the grand point always to be ascertained was the cost, and the balance of profit and loss must show whether a particular course was profitable or not (Hear, hear). If to the industry which as a body they undoubtedly possessed were only added the knowledge for the acquisition of

which they had now so many facilities, their position would in the end, he believed, be very much improved (Hear, hear). He would not detain them longer, but would at once ask them to drink "Success to the London Farmers' Club."

The toast was drunk with honours.

Mr. BAKER said he had been requested by the committee to respond to the toast; and although the task might have fallen to much better hands, his anxiety to serve the club and the agricultural interest generally would not allow him to refuse. The advancement of that club must to all of them be a matter of great solicitude. He was certain that there were few present who had not always watched its proceedings with great interest, and who were not exceedingly delighted that it had attained such a degree of prosperity. Much, however, remained to be done; many important subjects required yet to be discussed: and what was most essential was, that a larger number of tenant farmers should be induced to join the club. It was evident that if some of the first men belonging to their class met together to discuss subjects specially interesting to that class, the result must be an emanation of light as from a common centre, which would benefit the agricultural community generally. The discussions of the club did not end with the club; by means of the press they found their way through the whole area of the kingdom, and a vast mass of information was diffused which was of the utmost importance to agriculture. The origin of farmers' clubs was of recent date, and it was to be attributed, he believed, to some of the members of that body, which he trusted was not the least among the existing clubs in point of utility. They would not take upon themselves the assumption that that was the first club in the kingdom because it was the London one, for they knew that there were other clubs, especially in the north of England, which were remarkable for intelligence and for the value of their discussions (Hear). Let it be their effort to continue to make progress. Let every one put his shoulder to the wheel on behalf of the club. Let every one endeavour to make additions to their number, as these would bring not only subscriptions but intelligence. He regretted exceedingly that, owing to the great distance at which many of the members resided from London, the attendance was not always so large as could be desired. Persons could not come from a long distance without incurring considerable expense; and the position of farmers of late had been such as to preclude them from spending so much in that way as they otherwise would do. He trusted, however, that the clouds were passing away, and that the time would soon come when they would be alike independent of the operation of any political causes on their profession, and of any peculiar depression of their pecuniary resources (Hear, hear). Although they might not be in so flattering a position as they had been, he trusted that such was the energy of the British farmer that he would always be, as he had been hitherto, the first farmer in the world. He had long felt that farming was, to a certain extent, in its infancy; that a vast deal remained to be unfolded to their view; that the sciences might be brought to bear upon agriculture more than they had

been; that machinery might be introduced to a greater extent, in order to lessen the expenses of cultivation; and that, being free from any political trammels like those to which they were subject for nearly the last half-century, they might work more for their own advantage in the end (cheers). He would recommend every one present to attend the meetings for discussion as often as was practicable; not only for the sake of the information which they would obtain, but also in order to convey information to others (Hear, hear). In conclusion, he thanked them on behalf of the committee for the manner in which they had responded to the toast; and assured them that as long as he belonged to the club, his best exertions should not be wanting to advance its interests (cheers).

Mr. FISHER HOBBS said that, since entering the room, he had been most unexpectedly called upon to propose the next toast. This he regretted the more, because he was persuaded that he could not do full justice either to it or to his own feelings in proposing it; and also because his friend Mr. Pusey, to whom the toast was to have been entrusted, and who had accepted the invitation of the Committee to dine there that day, was unavoidably absent, in consequence of the state of his health (Hear, hear). With these preliminary remarks, he would give them "The health of their excellent President, Mr. Ramsey" (loud cheers). That gentleman's abilities, and his uniform kindness, were well known to the members of this Club; but it was not that club alone, amongst the agricultural community, that was indebted to him. When they remembered Mr. Ramsey's exertions in the formation of the Newcastle Farmers' Club, in the establishment of a cattle market in the same important town, and, indeed, in the cause of agriculture generally; the ability and integrity with which he performed the duties of a magistrate; and the universal respect he had acquired as a mercantile man—he (Mr. Hobbs), as one who had enjoyed his friendship for many years past, was confident they would agree with him when he said the Committee had acted wisely and well in asking him to preside as Chairman that day (cheers). In the course of his address, Mr. Ramsey had alluded to certain matters of business, and had mentioned a few of the subjects which had been discussed at the meetings of the Club during the past year. Amongst these, he had referred to the malt tax, and had told them that the London Farmers' Club had, in some degree, been instrumental in forcing that question upon the attention of statesmen, and possibly of promoting the partial, and it might be, ultimately, the total and entire repeal of that obnoxious and oppressive tax. (Hear, hear). Now he (Mr. Hobbs) would take it upon himself to state, as his own opinion, and that of the farmers of England, that, although something had been promised them in that respect, the farmers were not satisfied with the proposition which had been laid before Parliament. (Cheers). For what was the fact? Why, that every feature of the tax that was most objectionable, and which constituted it a nuisance, so far as the farmer was concerned, would still remain in all its force. He would still be deprived of the right to use his own produce on his own farm in the manner most

profitable and advantageous to himself; and that curse of the country—the beer-shop system—would be continued, with all its accompanying evils. In his opinion, the only just and proper measure to be adopted was a total repeal of this oppressive impost; for a total repeal would cure both evils—allow the farmer to use his barley as he pleased, and at the same time root up that moral pest, the beer-shop. (Loud cheers). Every man who was anxious for the welfare of the labouring classes would regret the imperfect character of the contemplated measure of the Government in this respect; whilst, on the other hand, he must admit that now the English farmer was called upon to compete with the whole world, the least that could be done on his behalf was to allow him to use his produce in the manner he might deem most beneficial to himself (loud cheers). Surely no one would contend that there was any fairness in a system under which, before the agriculturist could make use of the corn he grew, the exciseman stepped in, and levied a tax upon it, without a drawback being allowed in any circumstances, though the linen manufacturer received a drawback on the whole of the soap he used in his processes (Hear, hear). If, then, the London Farmers' Club desired to be of any use to the country, he trusted they would not think it too late, even now at the eleventh hour, to express their opinions, and the opinion of the agricultural body at large, upon this most oppressive and obnoxious tax (cheers). His friend, the chairman, had stated that this club had not received the amount of support from the agricultural interest generally to which it was undoubtedly entitled. He (Mr. Hobbs) hoped, however, now that the jealousies and ill feelings which had hitherto existed amongst them were about to vanish for ever, that the farmers of England would do their duty to themselves, unite together in the assertion of their rights, and assist in carrying into effect such practical measures as would be for the advantage and the welfare of every class and interest in the state (cheers). In conclusion, he begged to give them the health of Mr. Ramsay, thanks to him for coming so great a distance to preside over them on that occasion, and might he live many years to continue an active and useful member of the London Farmers' Club.

This toast was drunk with three times three, and one cheer more.

The CHAIRMAN returned thanks, and bore testimony to the utility and value of the London Farmers' Club to the agricultural community at large. The improvements which had been effected of late years in the farms of the north of England were often spoken of in terms of praise. Undoubtedly there were many very excellent farms in the north, but he could tell his countrymen there that equally good farms were to be found in the south (cheers). It was only by meeting together in assemblies like those of the London Farmers' Club that they would be able to attain to any perfection in the science of agriculture; for they should remember that in their pursuits there was no "bottling-up" of secrets—(Hear, hear, and laughter)—no taking out of patents for the production of wheat, barley, oats, and turnips; but that every intellectual and improving farmer was always ready to impart in-

struction to his neighbour (cheers). The landlords might perhaps be termed monopolists, but the farmers were by no means so; they were ever anxiously desirous of communicating their knowledge to their neighbours (renewed cheers). As one deeply interested in the welfare of agriculture, he (Mr. Ramsey) hesitated not to say that he did not respond, and that he believed a bright day was opening upon them (Hear, hear). No doubt it had been a great struggle on the part of the farmers to maintain their position during the last few years; but they might rely upon it, that the interests of the landlord and the produce of the farmer would in the end, like all other commodities, be regulated by the state of the market of demand and supply. One thing was true. It was, that heretofore they had not looked into their affairs from that mercantile point of view, which in a country like this was indispensable. In fact, it was absolutely necessary that the English agriculturist should be a mercantile agriculturist. We were in a totally different position from continental countries, where the labourers contented themselves with poor fare and low prices. Here we were in a more artificial state. The various classes were not so widely different from each other. And he believed that the beautiful show of cattle by the Smithfield Club this week, the meetings of the London Farmers' Club, and the associations arising out of them, would ultimately conduce materially to improve the interests of agriculture (cheers).

MR. CUTHBERT JOHNSON said he had had committed to his care the toast of "Success to the Royal Agricultural Society of England." As had been well observed by their excellent Chairman, there was in agriculture no bottling up of secrets (Hear, hear). The English farmer, when he had made a discovery, did not attempt to keep it to himself, but endeavoured to make it known for the benefit of his neighbourhood. It was in that noble spirit that the great Society whose name he had announced had for many years operated (Hear, hear). Whether at the periodical meetings which they held in Hanover-square, or in those visits which they paid to various portions of this vast empire, they had borne in mind their own motto "Practice with Science;" and had endeavoured to glean from all sources, and to lay under contribution all the sciences, for the general benefit of the agriculture of their country (cheers). With what success their labours had been attended he need hardly remind the company. It would be remembered that, under their auspices, many great and important movements in agriculture had been fostered, if not first suggested; it would be remembered that in their time had been introduced that inestimable fertilizer, guano—that in their time had been introduced what was one of the greatest improvements of chemistry with regard to agriculture, the use of super-phosphate of lime. He was old enough to recollect that, when these agents were first announced, they were greeted, especially by those who understood the least about them, with a considerable degree of ridicule. He was old enough to recal the period when it was said that, to add sulphuric acid to anything good for the soil was a most ridiculous idea, and was to be classed with the visions of Johanna Southcote, or with the squaring of the circle. But they had lived

to see these things take their stand amongst the most great instruments of the farmer (Hear, hear). The great Society on whose merits he had spoken had endeavoured to bring to the aid of the English farmer sciences of every description—sciences in aid of the mechanical implements of the farm, as well as the science of chemistry: even meteorology had not been forgotten; and all their efforts had been attended with no small practical success. It was true that they made a mistake now and then; for instance, they were now offering a reward of £1,000 for the discovery of a manure equal to guano, which could be sold for £5 per ton. When they reflected that, if such a discovery were made, the secret could be sold in the City to-morrow for £100,000 at least, they could see that there was no reason to offer £1,000 for any discovery of that kind (laughter). Its own value would be a sufficient reward (Hear, hear). However, the offer was made with the best intentions; and although, without pretending to have Elijah's mantle, he would predict that the reward would never be paid, he must say the good, and ardent spirit in which it was offered was worthy of the greatest Agricultural Society that had ever existed in the world. He called upon them, then, as English farmers, to drink the toast with the greatest cordiality, and with it he would couple the name of a true English farmer, who had endeavoured, and successfully endeavoured too, to carry out the Society's motto in his own practice—his friend Mr. Hudson, of Castle Acre. The toast was drunk with the utmost enthusiasm.

Mr. HUDSON thanked the company for the honour conferred upon him. He trusted and believed that the Royal Agricultural Society of England had been of some use to this country; and not only to this, but to many other countries in Europe and other parts of the world. Mr. Johnson had alluded to a recent proceeding of that society. His hon. friend said he thought the reward the Council had offered would not be claimed. He (Mr. Hudson) hoped, however, that some scientific

man would be found to claim it, though whether he might take out a patent or not he did not pretend to say (cheers). The produce of their farms was subjected to three great charges in the shape of rent, labour, and manure. Under the last-mentioned head there were few of them now-a-days who did not expend large sums in the purchase of guano; and he must say he should prefer saving £300 or £400 a year in the cost of this valuable manure to going a begging to his landlord for a reduction of rent by that amount. (Hear, hear.) The question of manure was a most important one; and though some gentlemen might live upon rich soils which did not require artificial manures like guano, yet he could assure them that even the richest of soils might be benefited by its use. In another department also—that of farming implements, he believed the Royal Agricultural Society were effecting great good by means of the prizes they offered for improvements (Hear, hear). They had endeavoured as much as possible not only to cheapen the cost of production, but to effect such improvements in agricultural machinery as would lessen, not so much the amount of labour employed, as the excessive pressure upon the labourer, whose work was now, by the introduction of new and improved implements, rendered much lighter than it was some 20 or 30 years ago (cheers).

Mr. ROBERT SMITH gave "Prosperity to the Smithfield Cattle Club" (cheers).

Mr. DAVEY responded.

Mr. GORDON proposed "The Health of the Committee of Management."

Mr. TRETHERY acknowledged the compliment.

Mr. SIDNEY gave "The Local Farmers' Clubs."

Mr. OVERMAN replied to the toast.

The CHAIRMAN in very complimentary terms gave the health of the "Secretary," to which Mr. Corbet briefly replied; and the Rev. C. DAY afterwards responded to "The Visitors," the company broke up about ten o'clock.

## SMITHFIELD CLUB CATTLE SHOW.

JUDGES OF CATTLE AND LONG-WOOLLED SHEEP.—Robert Smith, Saml. Bloxridge, Chas. Stokes.

JUDGES OF CROSS-BRED SHEEP, SHORTWOOLS, AND PIGS.—E. Pope, Jno. Farncombe, Wm. Tanner.

STEWARDS OF BEASTS AND LONG-WOOLLED SHEEP.—John Buckley, William Loft, J. Tanner Davey.

STEWARDS OF SHORT-WOOLLED SHEEP AND PIGS.—James Burgess, J. Saxby, John Clayden.

### LIST OF PRIZES. DEVONS.

CLASS 1.—First prize of 25*l.*, to Mr. John Ayre Thomas, Witheredge, Devon, and the silver medal as the breeder; purchased by Mr. Copeland, of Windsor: second prize of 10*l.*, to the Earl of Leicester, Holkham Hall, Norfolk; purchased by Mr. Collingwood, of Lamb's Conduit Street.

CLASS 2.—First prize of 25*l.*, to the Earl of Leicester, Holkham Hall, Norfolk, and the silver medal as the breeder; purchased by Mr. Collingwood, of Lamb's Conduit Street: second prize of 10*l.*, to Mr. James Quartly, Molland House,

South Molton; purchased by Mr. James Ratchiffe, of May Fair, Piccadilly.

CLASS 3.—First prize of 15*l.*, to Mr. T. W. Fouracre, Durston, near Taunton, and silver medal as the breeder; purchased by Mr. Story, Thames Ditton: second prize of 5*l.*, to Mr. Samuel Farthing, Stowey Court, Bridgwater; purchased by Mr. Thos. Cook, Clapham Road.

CLASS 4.—First prize of 20*l.*, to Mr. Thomas Bond, Bishops Lydeard, near Taunton, and silver medal as the breeder; purchased by Mr. King, of Paddington Street: second prize of 10*l.*, to Mr. T. W. Fouracre, Durston, near Taunton; purchased by Mr. J. Harman, of High Wycombe, Bucks.

### HEREFORDS.

CLASS 5.—First prize of 25*l.* to His Royal Highness Prince Albert; silver medal to the breeder, Mr. Thos. Roberts, Leominster; purchased by Mr. G. Orris, 1, Prospect Place, De Beauvoir Square.

CLASS 6.—First prize of 25*l.*, to Mr. Daniel Maydwell, Ashstead, Surrey; silver medal to the breeder, Mr. Wm.

Stedman, Bedstone-hall, Ludlow; purchased by Mr. Bannister of Threadneedle Street: second prize of 10*l.*, to Mr. Josh. Phillips, Ardington, near Wantage; purchased by Mr. J. G. Stevens, of Oxford.

CLASS 7.—First prize of 15*l.*, to Mr. Samuel Druce, Eynsham, Oxon; silver medal to the breeder, Mr. Edmund Lewis, Breinton, Hereford; second prize of 5*l.*, to Mr. Frederick King, Nursling, Southampton; purchased by Mr. Watson, of Weybridge.

CLASS 8.—First prize of 20*l.*, to Mr. John Dunne Cooke, Brampton Brian, Ludlow, and silver medal as the breeder; purchased by Mr. T. Randall, London Road: second prize of 10*l.*, to Mr. Edmund Herbert, Powick, Worcester.

#### SHORTHORNS.

CLASS 9.—First prize of 25*l.*, to Mr. Joseph Stratton, Manningford Bruce, near Pewsey, Wilts; silver medal to the breeder, Mr. Richard Stratton, Broad Hinton, near Swindon; purchased by Mr. Smith, of Salisbury: second prize of 10*l.*, to the Duke of Rutland, Belvoir Castle, Grantham; purchased by Mr. W. Bottrell, Rochester Row, Westminster.

CLASS 10.—First prize of 25*l.*, to Mr. Richard Stratton, Broad Hinton, near Swindon, and silver medal as the breeder; purchased by Mr. W. Turner, Sheffield: second prize of 10*l.*, to Mr. Thomas Pulver, Broughton, near Kettering.

CLASS 11.—First prize of 15*l.*, to Mr. Joseph Phillips, Ardington, near Wantage; silver medal to the breeder, Mr. Thos. Garne, Northleach; purchased by Mr. W. Copeland, of Abingdon: second prize of 5*l.*, to Mr. John Tucker, The Abbey Print Works, Stratford, Essex; purchased by Mr. J. T. Justice, 9, Crown Court, Pall Mall.

CLASS 12.—First prize of 20*l.*, to Mr. Charles Towneley, Towneley Park, Burneley; silver medal to the breeder, Mr. J. S. Crosland, Burbage House, Hinekley; purchased by Mr. W. Turner, Sheffield: second prize of 10*l.*, to Mr. Stephen Gooch, Henningham, near Norwich; purchased by Mr. T. Randall, London Road.

#### SCOTCH, WELSH, OR IRISH BREEDS.

CLASS 13.—The prize of 10*l.*, to the Rev. Joseph Arkwright, Mark Hall, Harlow, Essex; purchased by Mr. W. Jeffery, Foubert's Place, Regent Street.

CLASS 14.—The prize of 5*l.*, to Sir John Cathcart, Bart., Cooper's Hill, Chertsey; purchased by Mr. Bannister, of Windsor.

#### OTHER PURE BREEDS.

CLASS 15.—Withheld.

CLASS 16.—The prize of 10*l.*, to Mr. William Dunning, Friar Waddon, Dorehester, and silver medal as the breeder; purchased by Mr. Dale, Walton on Thames.

#### CROSS OR MIXED BREEDS.

CLASS 17.—The prize of 15*l.*, to Mr. Joseph Phillips, Ardington, near Wantage; silver medal to the breeder, Mr. John Rayer, Eastington, near Northleach.

CLASS 18.—The prize of 15*l.*, to Mr. James Futeher, jun., Fovant, near Salisbury; silver medal to the breeder, the representatives of the late Mr. John Sherrin, flazlebury, near Blandford.

CLASS 19.—The prize of 10*l.*, to Mr. Robert Beman, Moreton-in-Marsh, Gloucestershire; silver medal to the breeder, the executors of the late Hon. Lady Ceckerell, Sezincott.

#### LONG-WOOLLED SHEEP.

CLASS 20.—First prize of 20*l.*, to Mr. Thomas Twitchell, Willington, Bedford, and silver medal as the breeder; purchased by Mr. Barclay, Great Titchfield Street: second prize of 10*l.*, to the Marquis of Exeter, Burghley House, Stamford; purchased by Mr. Griffiths, of Poland Street, Oxford

Street: 3rd prize of 5*l.*, to Mr. G. S. Foljambe, Osberton Hall, Workop; purchased by Mr. E. Bassett, Crown Court, St. James'.

CLASS 21.—First prize of 20*l.*, to the Marquis of Exeter, Burghley House, Stamford, and the silver medal as the breeder; purchased by Mr. Miller, of Notting Hill: second prize of 10*l.*, to Mr. Thomas Twitchell, Willington, Bedford; third prize of 5*l.*, to Mr. Lawrence Willmore, The Newarke, Leicester.

#### LONG WOOLS (NOT LEICESTERS.)

CLASS 22.—The prize of 10*l.*, to Mr. Wm. Hewer, Sevenhampton, near Highworth, and silver medal as the breeder; purchased by Mr. Minton, of Windsor.

#### CROSS BRED SHEEP.

CLASS 23.—First prize of 10*l.*, to Mr. W. S. Stevens, Gatehampton, near Goring, Oxon; silver medal to the breeder, the representative of the late Mr. Wm. Cowdery, Stevenon, Berks; second prize of 5*l.* to Mr. John Robt. Overman, Burnham Sutton, near Burnham market; purchased by Mr. W. Covell, of Sydenham, Kent.

CLASS 24.—The prize of 10*l.* to Mr. John Robt. Overman, Burnham Sutton, near Burnham Market, and silver medal as the breeder; purchased by Mr. T. Randall, London Road.

#### SHORT-WOOLLED SHEEP.

CLASS 25.—First prize of 20*l.*, to Mr. William Sausbury, West Lavington, near Devizes, and silver medal as the breeder; purchased by Mr. King, of Paddington Street: second prize of 10*l.*, to the Duke of Richmond, Goodwood; purchased by Mr. Anderton, Queen's Road, New Cross, Surrey.

CLASS 26.—The prize of 10*l.* to the Duke of Richmond, Goodwood, and silver medal as the breeder; purchased by Mr. W. Jeffery, Foubert's Place, Regent Street.

CLASS 27.—First prize of 20*l.* to the Duke of Richmond, Goodwood, and silver medal as the breeder; purchased by Mr. E. Flicke, Church Street, Fulham: second prize of 10*l.* to Lord Walsingham, Merton Hall, Thetford, Norfolk; purchased by Mr. King, of Paddington.

#### SHORT-WOOLLED SHEEP (not being SOUTH-DOWNS.)

CLASS 28.—The prize of 10*l.* to Mr. William Humfrey, Oak Ash Farm, Chaddlesworth, near Wantage, and silver medal as the breeder; purchased by Mr. Jas. Ratchiffe, of Hillington, Middlesex.

#### PIGS.

CLASS 29.—First prize of 10*l.* to Mr. John Coate, Hammond, near Blandford, and silver medal as the breeder; second prize of 5*l.* to Sir John Conroy, Arborfield Hall, Reading.

CLASS 30.—First prize of 10*l.* to Sir John Conroy, Arborfield Hall, Reading, and silver medal as the breeder; second prize of 5*l.* to his Royal Highness Prince Albert.

CLASS 31.—First prize of 10*l.* to Mr. Samuel Druce, jun., Eynsham, Oxford, and silver medal as the breeder; second prize of 5*l.* to Mr. Fredk. Crockford, Harrow Weald Park, Stanmore.

#### EXTRA STOCK.

Silver medal, to the exhibitor of the best heast, to Mr. Robert Beman, of Moreton-in-Marsh.

Silver medal, to the exhibitor of the best long-woolled sheep, to Mr. William Sanday, of Holue Pierpoint, Notts; purchased by Mr. H. Green, Kingsland Road, Shoreditch.

Silver medal, to the exhibitor of the best short-woolled sheep, to his Grace the Duke of Richmond, of Goodwood.

Silver medal, to the exhibitor of the best cross-bred sheep, to Mr. J. R. Overman, of Burnham Sutton, Norfolk; purchased by Mr. John Mason, Queen Street, King's Road, Chelsea.

Silver medal, to the exhibitor of the best pig, to Sir John Conroy, of Arborfield Hall, Reading.

#### GOLD MEDALS.

Gold medal, to the exhibitor of the best steer or ox in the 1st, 2nd, 5th, 6th, 9th, 10th, 15th, 17th, or 18th classes, to Mr. Richard Stratton, of Broad Hinton, near Swindon.

Gold medal, to the exhibitor of the best heifer or cow in the 3rd, 4th, 7th, 8th, 11th, 12th, 16th, or 19th classes, to Mr. J. D. Cooke, of Brampton Brian, Ludlow.

Gold medal, to the exhibitor of the best pen of one-year-old long-woolled sheep, in the 20th, 21st, or 22nd classes, to the Most Hon. the Marquis of Exeter, of Burghley House, Stamford.

Gold medal, to the exhibitor of the best pen of one-year-old short-woolled sheep, in the 25th, 26th, or 28th classes, to Mr. William Sainsbury, of West Lavington, Devizes.

Gold medal, to the exhibitor of the best pen of pigs in the 29th, 30th, or 31st classes, to Mr. John Coate, of Hammoon, Blandford.

#### HIGHLY COMMENDED.

His Royal Highness Prince Albert's Devon ox; purchased by Mr. Minton, of Windsor.

The Right Hon. Lord Soudes' short-horn ox; purchased by Mr. J. Mason, Queen Street, King's Road, Chelsea.

Mr. Richard Stratton's short-horn cow.

Mr. W. Hewer's cross-bred ox; purchased by M. Moorrens, of Antwerp.

Mr. W. Abraham's Leicester sheep; purchased by M. Moorrens, of Antwerp.

Mr. W. Hewer's Cotswold sheep; purchased by Mr. W. H. White, of Shadwell.

Mr. Samuel Druce's pen of cross-bred wethers; purchased by Mr. G. Ching, Warren Street, Fitzroy Square.

Mr. Samuel Davis's pen of cross-bred wethers; purchased by Mr. E. Williams, Bermondsey Market.

Mr. W. P. Salter's pen of cross-bred wethers; purchased by Mr. Withers, of Guildford, Surrey.

Mr. W. Rigden's pen of Southdown wethers; purchased by Mr. Davy, of Brighton.

Sir R. Throckmorton's pen of Southdown wethers; purchased by Mr. W. Glass, Lambeth Walk.

Mr. James Sharp's pen of improved Hampshire Down wethers; purchased by Mr. C. Walker, High Street, Hampstead.

The Right Hon. Lord Walsingham's Southdown sheep; purchased by Mr. Jas. Radcliffe, May Fair, Piccadilly.

Mr. W. S. Wood's pen of Sussex and Neapolitan pigs.

The Right Hon. the Earl of Radnor's pen of Coleshill pigs.

Mr. W. J. Sadler's Berkshire pigs.

#### COMMENDED.

Mr. John Carwardine's Hereford steer; purchased by Mr. Sheppard, of Holloway.

The Earl of Radnor's Hereford ox; purchased by Mr. Stimpson, of Wandsworth.

Mr. T. W. Hick's Hereford cow.

The Earl of Radnor's Hereford cow.

Mr. Wm. Allatt's Hereford cow.

Mr. James Stratton's short-horn steer; purchased by Mr. T. Ford, Kinton Street, Brunswick Square.

Mr. R. Bull's Durham ox; purchased by Mr. Caldwell, Portland Place, New Kent Town.

Mr. Richard Spraggett's short-horn steer.

The Right Hon. Lord Feversham's short-horn heifer; purchased by Mr. Craig, of Mount Street.

Mr. W. H. Goodwin's short-horn heifer.

Mr. Thomas Crisp's short-horn heifer; purchased by Mr. Bridges, Earl Street, Manchester Square.

Mr. Featherstone's short-horn heifer.

Mr. George Carrington's short-horn cow; purchased by Mr. W. Jordan, of Barnet.

Mr. J. H. Gurney's cross-bred ox; purchased by Mr. Cockrill, of Newgate Market.

Mr. Edward Newbatt's short-horn heifer; purchased by Mr. R. Harris, Chertsey.

Mr. L. Willmore's Leicester wether.

Mr. G. S. Foljambe's Leicester wether; purchased by Mr. Peaty, of John Street, Portland Town.

Mr. John Hitchman's pen of cross-bred wethers.

Mr. John Williams's pen of Southdowns.

Mr. H. S. Hayward's pen of Southdowns; purchased by Mr. Deacon, of Kilburn.

Mr. William Rigden's Southdown sheep; purchased by Mr. Davy, of Brighton.

Mr. M. Newman's pen of pigs.

Mr. Chamberlain's pig.

#### COMMENDED GENERALLY.

Mr. J. H. Gurney's cross-bred ox.

Mr. Edward Newbatt's short-horn heifer.

Mr. L. Willmore's Leicester wether.

Mr. G. S. Foljambe's Leicester wether.

Mr. J. Hitchman's pen of cross-bred wethers.

Mr. J. Williams's pen of Southdowns.

Mr. H. S. Hayward's pen of Southdowns.

Mr. Wm. Rigden's Southdown sheep.

Mr. M. Newman's pen of pigs.

Mr. Chamberlain's pig.

B. F. BRANDRETH GIBBS, Hon. Sec.

The first is generally the least crowded day of the show, but on Tuesday, notwithstanding the unfavourable state of the weather, there was a good average attendance of visitors. Many came as buyers, and before the exhibition closed a large proportion of the stock had changed hands. The advantages of the new arrangements, both with reference to the animals themselves and the space for their accommodation, were very apparent, and gave general satisfaction.

A more careful survey of the whole display than it was possible to take at a late hour on the previous night confirms our first impressions as to its sustained excellence in all the classes. There are not more than half-a-dozen beasts shown of a decidedly second-rate character; and the two worst of these are foreigners. It is to be hoped that the introduction of continental stock at these annual exhibitions may not be discouraged by the overwhelming character of the competition to which they are unavoidably exposed. They have established a place for themselves in our markets, and our agriculturists can take no harm, and may derive some useful hints from seeing the best Dutch cattle once a year placed in juxtaposition with their own. Among other features of the present display may be noticed the skill with which our breeders, in each class, are rearing their animals so as to approach certain standards of shape. Their unremitting exertions have enabled them to get rid of old defects, which were at one time regarded with favour, and so to manage that their stock shall carry the greatest amount of fine meat in the best places. The North Devons have always had, and still retain the ad-

vantage in this respect; but it is wonderful what improvements towards the same end have been made in other breeds, and especially the Herefords and short-horns. If any one wants an illustration of this, let him compare with any of the prize cattle an old-fashioned short-horned cow exhibited by the Marquis of Exeter—not a bad specimen of her kind, but still illustrating, by contrast, the increased symmetry of younger animals. The most remarkable beast in the yard is certainly Mr. Richard Stratton's ox; its shapeliness and enormous size unite in giving it an advantage to which, were either of these qualities considered separately, it would, perhaps, not be so clearly entitled. Among the cattle we notice one rather singular fact, that while three is a fair show of West Highlanders, Angus, and polled Galloways, there is not a single entry of Welsh or Irish. How comes it that our northern agriculturists, even from as far as Shetland, are thus represented, while from the rich pastures of the Emerald Isle and from the hills of the principality nothing is sent? The classes devoted to cross-breeds contain some capital specimens, and as these, after all, show the staple which supplies our markets with beef, they will be examined with proportionate interest. Among them will be found one remarkably fine steer, exhibited by Mr. Joseph Phillips, of Ardington, Berks, and an equally handsome heifer, shown by Mr. Robert Beman, of Moreton-in-the-Marsh, Gloucestershire. If in their awards for cattle the judges have made any mistake, we should be disposed to say that it was in giving a prize to Prince Albert's Hereford steer, which seemed to us not comparable to that of Mr. W. Heath, of Ludlamhall, Norwich, standing next to it. Early maturity, economy in feeding, and a carcass affording the largest quantity of meat distributed in the best joints, ought to be the tests of a good show of fat cattle. The judges point out the finest beasts, but without, we fear, the essential reference to those other considerations upon which the practical value of the exhibition depends.

In the display of sheep, the present show comes out very strongly, and here again, in all the classes, great excellence is attained. The Marquis of Exeter carries off the gold medal for the best pen of one year old Leicesters, and Mr. Sainsbury, of West Lavington, shows the best one year old South Downs. There is also a considerable display of cross breeds of extraordinary merit, and to which some of our most eminent agriculturists have contributed. We would draw particular attention to the pens exhibited by Mr. G. R. Overman, of Burnham Sutton, Norfolk, and Mr. W. S. Stevens, of Galthampton, Oxfordshire. One point which occurs forcibly to the visitor of these annual shows is the preference which the Smithfield Club appears to give to pure over cross-bred stock, notwithstanding that first crosses are of all the most profitable to send to market, that Smithfield is necessarily supplied with a small proportion of pure bred sheep, and that an exhibition like that in Baker-street is one where strict attention to purity of blood is not requisite, and can be dispensed with. The tendency of such predilections is to shut out practical men from the competition, and leave it in the hands of the breeders and amateur agriculturists. The club, it will be per-

ceived on reference to the prize-list, gives no gold medal except in the pure breed classes, and their money premiums for those classes are on a larger scale also. There is an obvious risk in making such distinctions with their new classification, for they will thus be insensibly drawn on until all difference between their exhibition and that of the Royal Agricultural Society disappears.

The present show of pigs is quite equal to that of former years; and the pen to which the gold medal has been awarded will for the next few days occupy no small space in the attention of visitors. Those who cannot work their way through the crowd to see them will do well to examine the porkers sent to Baker-street by that enterprising and skilful agriculturist, Sir John Conroy. They are excellent of their kind, and have won him no less than three prizes.

To the existing attractions of their show we understand that the club contemplate adding next year a display of poultry, which cannot fail to be popular. One of the smaller evils of Protection was that it brought into unmerited contempt an interesting and profitable branch of rural industry, which being neglected, our poultry and eggs became so dear and bad that we had, and still have, to draw our principal supplies of them from France and Belgium.

As an offshoot of the exhibition of stock, the bazaar contains also a great collection of agricultural implements supplied by the best makers, and two collections of farm produce, which are of a very remarkable excellence, and deserve the careful inspection of every visitor. The first of these is by Gibbs and Company, of Half-moon Street, seedsmen to the Royal Agricultural Society. It is beautifully arranged, and shows great care in the selection of the specimens. The second is a contribution from that valuable institution, the Royal Dublin Society, and illustrates the capabilities of the Irish soil and climate for the growth of green and root crops in a manner truly wonderful. Mr. Corrigan, the society's curator, has brought over this highly creditable display of farm produce, which we understand, is the residue of the society's last autumnal show, and is composed of contributions from the best agriculturists in Ireland.—Times.

#### EXHIBITION OF AGRICULTURAL IMPLEMENTS.

The number as well as the usefulness of the variety of engines, machines, and agricultural implements generally which crowded the galleries of the Smithfield Show yard, are well deserving of some especial notice, the more particularly as little remark has yet been offered on them by those journals which necessarily precede us in publication. We so turn to our note book for what we have been able to jot down somewhat hastily, but, as we hope, will be found altogether impartially.

Of ploughs there were exhibited by Messrs. Ransome and Sims of Ipswich, Busby of Yorkshire, Howard and Williams of Bedford, Bentall of Essex, some excellent im-

plements, the merits of which are widely and beneficially known throughout our country. There were also a number of American ploughs exhibited by Dray and Co., Burgess and Key, and others. These ploughs, or a modification of them, are calculated in a peculiar manner for the cultivation of all free-working soils; we therefore think they will become extensively used by light-land farmers; their lightness of draft, while they turn a wide furrow completely over, in the act shaking and cracking the earth to a great extent, insuring expedition, combined with the nearest approach to fork cultivation.

In the stand of Messrs. Howard and Williams, of Bedford, we found again exhibited their widely-known zigzag barrows.

Amongst corn and seed drills Messrs. Hornsby, Garrett and Smyth, have taken and kept the lead for a great number of years, their long lists of prizes being the evidence of a cloud of witnesses; indeed, we think many of their drills are perfect. Mr. Hensman, of Woburn, exhibited his improved Bedford steer drill—the latest and greatest improvement in which rests in hanging the seed box and sowing apparatus in such a way that it maintains its level while the drill is going up or down hills; thus, under all circumstances, insuring equal sowing.

In manure drills and distributors Hornsby and Garrett take the lead; in fact, the perfection of this class of machines is mainly due to these two gentlemen.

Mr. Barton showed a liquid manure drill of great merit and utility. We understand that the idea was given him by Col. Challoner, who has found vast advantage from its use on light dry soils, especially in forcing the young turnip plants out of the way of the fly.

We observed a guano tester on Cogan and Co.'s stand, which, if correct in its powers, ought to be in the hands of every farmer, as well as every honest manure dealer.

Perhaps, however, the most striking advance upon former shows was in the reaping machines. There was a great variety of modes of cutting, each claiming merit, and no doubt possessing great advantages for certain purposes; but which of them is the best for cutting the grain crops of England time has yet to prove. First Bell's, on the perfect scissor or clipping principle; Crowley's and M'Cornick's, the drawcut with a sickle edge; Dray and Co.'s, the Husseyan or chopping plan; Garrett's, a combination of the clipping and chopping principles; Crosskill's, a combination of the drawcut and clipping principles, with a fine serrated edge. All these plans have been more or less used, and found to answer in different degrees. The clipping has had the longest practice, and has retained the highest merit wherever it has come in competition with the others, as the farmers require a reaping machine—and no machine can be fully entitled to the name, except it cuts and lays down the crop in a continuous swathe, or in parcels large enough for sheaves. Thus the success of such an implement will not be dependent upon the activity and muscular strength of labourers, who are a class of men that do not like to be put much out of their old pace of moving; this, coupled with the past wet harvest, and heavy crops, proved almost fatal to the American reapers; while Bell's, under the same

disadvantageous circumstances, was applauded wherever it went. We are convinced that its great success lay much in its cutting, gathering, and laying down the cut crop in a beautifully arranged swathe, without the aid of man, except as far as driving the horses is concerned; and here the driver using a pair of reins, and steering or guiding it like a plough, soon feels himself at home, because the mode of action is thoroughly understood by him. We are convinced that if the harvest had been as dry as usual, the American machines would have gained a fair share of confidence among the farmers, and with some improvements, we are of opinion, they will become a popular and useful branch of machinery.

Of hay tedding machines there were Smith and Ashby's, and Wedlake's, both excellent; from what we know of Smith's, we have no hesitation in pronouncing it about perfect.

Horse-rakes of great merit were exhibited by Messrs. Howard, of Bedford; Williams, of Bedford; and Smith and Ashby, of Stamford.

The spades, draining-tools, forks for all purposes that are required in agriculture, manufactured by Mr. Winton, of Birmingham, were exhibited by various firms. These hand-tools are all of the most beautiful make; their lightness, combined with extraordinary strength and power of withstanding continuous wear against stones and other hard substances without losing their edge, makes them appear more like magical than farming tools; indeed, if we were to go into a calculation of the amount of human labour thrown away annually by wielding clumsy tools in the various agricultural operations, we feel satisfied the result would be found astounding.

Mr. Barton exhibited a new plan of hoe of various sizes for manual use. This tool is worked on the same principle as the breast or thrust plough. On a similar handle or shaft to that used in the breast-plough are fixed from two to four hoes; the labourer thrusts these before him, hoeing as many drills of corn as there are hoes. In green crops two hoes are fixed on the handle, just far enough apart to allow the row of young plants to escape being cut up, as the labourer proceeds thrusting this tool before him, with a hoe on each side of the drill of turnips, or any other green crop.

Mr. Hill, of Brierly Hill, exhibited a variety of his wire and iron fencing, as well as a variety of gates, sheep and cattle hurdles, all of which have been long and widely known for their general utility and economy.

Of one-horse carts there were some of good form and simple construction exhibited by Crosskill, Busby, and Crowley; but for excellency of materials, beauty of workmanship, simplicity, lightness, and strength, we saw few equal to those on Crosskill's stand.

We observed that Mr. Hornsby had made an important improvement in Burgess and Key's turnip cutter, which will do much towards spreading its merits for the benefit of the farmers; Gardener's well-known turnip cutter too has lost none of its merits in the hands of his successor, Mr. Samuelson, of Banbury.

In horsehoes there was an excellent show: Garrett's, of Saxmundham; Smith's, of Kettering; and Williams', of Bedford amongst the most perfect. The latter is



Smith's, greatly improved by Mr. Nicholson; these improvements are such as enable the man with ease to guide the implement against irregularities and the swerving of the horse out of the straight line. The low price at which this implement can be made, and its general utility, will make it a formidable rival to Garrett's justly famed implement. Messrs. Busby, Howard, Edward Hill, of Brierly Hill, and others, exhibited useful turnip horse-hoes for ridge cultivation.

In thrashing machines there was but small competition, owing to the rule that nothing above a ton in weight is allowed. There was a very pretty little combined thrashing, shaking, and winnowing machine exhibited by Clayton and Shuttleworth, of Lincoln; while Garrett, Holmes, Hensman, and Ransome exhibited their well-known machines, as improved and approved.

In corn-dressing machines there was good competition between Hornsby, Cooch, Fridmore, and Holmes, all possessing great merit, and improved on since last year.

In chaff-cutting machines Richmond and Chandler have stolen a march upon all others, by effecting a perfect draw-cut with a serrated edge, through spiral blades. This machine is acknowledged by all engineers and mechanics to be the most correct in all its principles and details ever brought before the public.

There were other good chaff-cutting machines exhibited by Cornes, Smith and Ashby, Hornsby, Garrett, Ransomes and Sims, and Richmond and Chandler.

In metallic grinding mills there was a variety for competition, from the noisy roller mill to Harwood's still, smooth-running, steel mill, which grinds, or rather cuts, all sorts of grain and pulse into small or the minutest parts, with less power than any other sort of mill we know of; and if the agricultural public could be satisfied that this steel mill was as lasting and economical in its grinding parts as it is easy and economical in the power required to drive it, few farmers would be without one.

There were also stone meal and flour mills shown by Clayton and Shuttleworth and Mr. Hayes, all of simple and good construction.

Messrs. Richmond and Chandler (Manchester), and Stanley (Peterboro'), exhibited their first-class cooking apparatus for preparing food for farm stock, especially useful for dairy cows and pigs.

Cogan and Co. showed their milk testers that immediately proved the quantity of water used by milksellers to increase their profit; and with them their lactometers that prove the per centage of cream produced by milk.

Mr. Ewart brought his improved cattle and other gauges; they are very useful assistants in ascertaining the weight of fat animals, and the weight of hay in stacks; while his excellent spring horse halter is well calculated to prevent those accidents that so often arise from horses getting their feet over the halter.

J. H. Cuff exhibited his widely-known cattle and horse medicines. Mr. Bigg, his sheep-dipping apparatus and solution; which, wherever used, has given proportionate comfort to the flock and profit to the master.

Mr. Long had also his sheep-dressing, and a simple means of holding the sheep while being dressed.

Mr. Read, of Regent-street, exhibited his well, but not sufficiently known, combination of those useful (we might say indispensable) instruments, the probang, stomach-pump, and injecting-pump. This set of instruments has saved the lives of great numbers of cattle and horses, that must have died had any time been lost in going any distance for relief; there ought to be at least two or three sets in every village, and one at every lone farm-house.

The show of steam-engines was capital: the exhibitors were Messrs. Clayton and Shuttleworth, of Lincoln; Barrett, Exall, and Andrews, of Reading; Tuxford and Sons, of Boston; and Garrett and Son, Saxmundham; Hornsby and Son contenting themselves with exhibiting a long list of prizes obtained for their engines. The fixed six-horse power engine shown by the Messrs. Tuxford was compact and simply-arranged.

Mr. James exhibited a variety of weighing machines for weighing all sorts of live farming stock and other produce of the soil. We are strongly of opinion that the time is not far distant when farmers will use the test of weighing the food for their stock, and the stock occasionally while growing or fattening; thus the farmer will be able to detect the errors he committed in selecting or breeding his stock, and the feeding value of each description of farm produce. In fact, we were the more impressed with this idea as we mused over the immense size and weight of the fruit, roots, and plants we saw on the stands of the eminent seedsmen; and especially on the produce of the Emerald Isle, sent over from the Dublin show, which spoke louder than words that both the soil and climate of Ireland are all that can be desired.

#### STEAM ENGINES.

The yard adjoining the premises was visited in the course of the day by numerous scientific and practical agriculturists, the source of attraction being a number of portable steam-engines, at work, by the most eminent makers, including Messrs. Garrett and Son, Messrs. Tuxford and Sons, Mr. Hornsby, and Mr. Burrell. The engine of Messrs. Garrett and Son was shown in connection with their very complete threshing machine, to which we yesterday alluded. The engine of Mr. Burrell was also shown driving a threshing machine. The engine, however, of Messrs. Tuxford and Sons excited the greatest amount of attention and interest. The advantages of the portable housed engine of this firm are self-evident, and the number of them which has been made by the firm proves that they are duly appreciated. At the late Great Exhibition this engine was selected by the engineers of the French and Prussian Governments as the best shown, and two of them were purchased for deposit—one in the Conservatoire des Arts et Métiers, and the other in the Museum of the Royal Society at Magdeburg. The working parts of the engine are effectually protected when at work from the destructive grit and dust especially given out in most agricultural operations. They are secured from the weather at all times; and from any interference with their working parts, being under lock and key. They may be managed by any ordinary farm labourer, with a few days' instruction. They have upright cylinders, this, it is contended, being the best position to ensure the cylinders not wearing oval, as is the case with the horizontal cylinder. The "governors" of the engine act in a very simple and effective

manner direct upon the throttle valve, and, from their arrangement, cannot well be put out of order. The boiler is made of *Lox-moor* iron, and has water-space flues leading from the fire-box and returning through lap-welded iron tubes, thus avoiding immediate contact of the tubes with the fire. The total weight of a six-horse engine, mounted on four wheels, is but 54 cwt.; the consumption of coal does not exceed the extraordinary low amount of 4 cwt. per day of ten hours. Every precaution is adopted, by means of "spark traps," to avoid accidents arising from flying sparks. Few questions are of greater interest to the agriculturist than the application, in as simple and as economical a manner as possible, of steam power to the varied operations of the farm; and it is pleasing to find the energies of the most eminent agricultural machinists devoted so strenuously to the subject.—*Morning Chronicle* of the 9th December.

## SMITHFIELD CATTLE MARKET.

MONDAY, Dec. 13.

### THE GREAT CHRISTMAS CATTLE MARKET.

From the fact that the past season has been an unfavourable one for the production of fat stock, it was, at one period, pretty generally imagined that the supplies of Beasts fit for Christmas consumption, and which are invariably shown at this particular period, would have exhibited a material falling off, both as to number and quality. The result of this day's proceeding, however, has completely falsified the anticipation. We have intimated above that the rearing of good stock this year has been a most difficult affair. All who have narrowly watched the numerous changes in the temperature, must agree with us that the graziers have had to contend with numerous disappointments, and, in some instances, with heavy losses. For instance, the country suffered considerably from the want of moisture during the month of April and nearly the whole of May; hence the quantity of grass in the pastures was quite inadequate to meet the usual consumption: both Beasts and Sheep were kept upon dry food quite two months beyond the usual period; and the whole of the winter stock of hay was speedily consumed. Later in the season, succulent food became somewhat more abundant; but, during the last twelve weeks, such has been the "puddled" state of the land, at least two-thirds of the stock which ought to have been depastured have been taken into yards, closes, &c. It will, therefore, be perceived that good grounds existed for supposing that the show here this morning would have exhibited a great deficiency compared with former years. As a proof that we have not over-estimated individual losses, we may observe that fully one-half of the Beasts derived from the northern counties this year have been in very little more than a half-fat state. There is one redeeming point which we must not fail to notice, viz., the uniform good health which the Beasts and Sheep have secured; indeed, the losses by disease and other casualties have been small in the extreme—certainly not one-fourth of many preceding seasons. It has been observed that, since the passing of the Tariff, the value of meat has never ruled so steady as during the whole of this year. That such has been

the case we do not deny; but our readers will bear in mind that the home production—although the numbers of stock on sale here have been extensive—has not kept pace with the demand, which has been freely met by the importers from the Continent. It is not enough for us to be informed that there have been large arrivals: the question for us to consider is, what is the available supply of food? Again, the advance in the value of hides, rough fat, &c., has given a slight impetus to the trade; but, above all, we may refer to the enormous consumption of meat now going on. This consumption is very little more than half met by Smithfield. Railway communication, and the great activity in most branches of commerce in our leading districts, have opened up markets which, at one time, were entirely closed against those who have embarked their capital in various ways. The rise in the price of rough fat, since December last, has been very nearly 1d. per lb., it being now quoted at 2s. 8d., against 2s. 1d. in 1851. This, of course, tells largely; but the improved price is almost wholly the result of the small shipments of Tallow from Russia and other quarters, including South America.

The proceedings in Baker-street, last week, are calculated to inspire us with much confidence on the future success and increased usefulness of the Smithfield Club. The numerous changes in the mode of classifying the beasts have given great satisfaction to those immediately interested; nevertheless, all parties are agreed that more might be done by which the show would be greatly improved. Now, it does not require much consideration to prove that the very best stock has been neglected, owing to the miserable prize offered for it. The Scotch breeds have long stood pre-eminent for their fine quality and splendid symmetry, and yet the leading object of the promoters of the Society has been defeated from a want of due consideration to, perhaps, the best description of beasts in the whole world!

Railway accommodation has been severely put to the test to bring up the enormous number of bulky animals shown here, and it is calculated that from five to six hundred engines were employed yesterday upon the various lines to bring the stock to market. The mode in which they have come to hand reflects great credit upon the officials, and has secured to the graziers a much larger return than if the stock had to travel on foot. No accidents worthy of notice have been reported, and, taken as a whole, the proceedings have passed off remarkably well. This is, perhaps, the last time that we shall have occasion to report the holding of a "great" market in Smithfield, as it is pretty generally hinted that the next great day will be held in Copenhagen Fields. Whilst admitting that the area of the market was inadequate to contain the whole of the stock, large numbers being exhibited in Giltspur-street and on Snow-hill, every effort was made by the City authorities to prevent confusion and inconvenience.

At an early hour the influx of visitors was very great, and they continued to pour in throughout the day. To the numerous foreigners present the sight must have been a most remarkable one, for we can scarcely imagine that a similar exhibition to the present has ever been met with on the continent.

As regards the merits of the Beasts shown, we may observe that we have seen them equalled, but never excelled. In the first class for weight we may place the Shorthorns; in the next, for weight and symmetry, the Herefords; in the next, for general usefulness, the Devons. The show of Scots was a remarkably good one, and not a few were of heavy weights, especially those from Norfolk and Aberdeen. From nearly every county in England stock came to hand, and amongst which we noticed some fine Sussex Oxen and Pembroke-shire Runts in first-rate condition, and which sold at comparatively high prices. There were several remarkably fine short-horned Heifers from Lincolnshire, as well as some old Durhams, and a small sprinkling of Irish breeds. Very few homebreds were on offer, and it is a cause of regret with some parties that this peculiar breed has been so much neglected of late years. The following are the numbers of Beasts exhibited, and the prices obtained for them on the great days, during the past thirteen years:—

Year.	Beasts shown.	s.	d.	s.	d.
1839	5,074	3	4	5	0
1840	3,528	4	4	5	8
1841	4,500	3	8	5	0
1842	4,511	3	4	4	8
1843	4,510	2	8	4	4
1844	5,713	4	0	4	6
1845	5,326	3	6	4	8
1846	5,470	3	6	4	6
1847	4,282	4	0	5	8
1848	5,942	3	4	4	8
1849	5,765	3	4	4	6
1850	6,341	3	0	3	10
1851	6,103	2	8	4	2

The imports of foreign stock into London, last week, were seasonably good, but of very middling quality. The total supply amounted to 4,869 head, against 3,628 during the same period in 1851; 5,734 in 1850; 3,720 in 1849; 3,155 in 1848, and 1,913 in 1847. On the Dutch coast the navigation is still open.

IMPORTS INTO LONDON LAST WEEK.

From whence.	Beasts.	Sheep.	Calves.	Pigs.
Hambro'	..	26	..	..
Amsterdam	83	912	34	3
Dordt	21	..	12	..
Ostend	..	254	7	..
Hartlingen	84	1313	10	..
Antwerp	..	23	37	..
Rotterdam	211	1432	403	..
<b>Total</b>	<b>399</b>	<b>2955</b>	<b>503</b>	<b>3</b>

The Yearly Comparison of Weekly Imports is as under:—

	1851.	1850.	1849.	1848.	1847.
Beasts	567	859	533	625	258
Sheep	2571	4473	2937	2432	1584
Calves	462	369	239	96	71
Pigs	25	33	11	2	..

Imports in Ten Months in the present and two previous Years:—

	1850.	1851.	1852.
Oxen	23,424	29,000	33,348
Cows	13,641	13,048	20,016
Calves	6,728	20,579	22,301
Sheep	103,677	142,668	170,931
Lambs	5,828	8,578	12,339
Pigs	5,110	13,554	9,113

We have already observed that the show of Beasts here this morning was a most excellent one, and we now proceed to detail individual merits. Mr. Robert Morgan had certainly the finest lot of Beasts in the market. Amongst the stock consigned to Mr. Morgan were some

wonderful Shorthorns and other breeds, fed by Mr. Wm. Goodall, of Deeping; Mr. W. Goodall, of the same locality; Mr. Robert Cook, of Portland; and Mr. Cooper, of Swineshead. There were likewise shown on the same stand some splendid cattle from Scotland, belonging to Messrs. Knowles, Milne, Cooper, Thompson, and others, from Aberdeenshire. Several fine animals came from Norfolk, bred by Mr. Felton of Duntun, Mr. Robert Leeds of Lexham, and Mr. Postle. One of the Beasts shown by his Royal Highness Prince Albert in Baker-street was offered by Mr. Morgan. Mr. Daniel Maidwell had a very fine show of Scots, especially the 30 sent by Mr. M'Combie from Aberdeenshire. Mr. Vorley exhibited several very fine Heifers, the property of Sir Charles Knightley, and some prime ones fed by Mr. Cooper of Hilbury, near Aberdeen. Mr. Thomas Dixon brought forward several lots of well-fed animals, sent by Mr. T. Clark, of Banbury, and Messrs. Walsingham and Taylor, of Long Sutton, Lincolnshire. He had also on sale a very fat Heifer belonging to the Marquis of Exeter, and some fine Heifers the property of Messrs. Duckett of Bermondsey. Mr. Gurrier had an extraordinary fine show of Scots.

The supply of Sheep was a good one, and by far the finest lots offered were by Messrs. Weall, who had 30 very fine Downs, fed by E. F. Whittingstall, Esq., of Langley Bury, Herts; 100 superior Gloucester Ewes, forwarded by R. Rowland, Esq., of Creslow, and several lots from Oxfordshire, Berks, and Herts. Messrs. Giblett and Gurrier exhibited 20 fine Cotswolds bred by Mr. W. Hewer, of Northleach, Gloucestershire. We also noticed some well-bred Sheep in Messrs. Whitbread and Starkey's pens.

STATE OF THE TRADE.

Notwithstanding that the number of Beasts was not in excess of the corresponding market in 1851, and that the attendance of both town and country butchers was extensive, the Beef trade—owing to the heavy rain which fell throughout the day, and the unfavourable state of the weather for slaughtering—ruled inactive; nevertheless prices were supported. The general top figure for Beef was 4s., but a few very superior Scots realized 4s. 2d. per 8lbs., and a good clearance was effected.

About 3,000 Beasts came to hand from Lincolnshire, Leicestershire, and Northamptonshire; 1,800 Herefords, runts, Devons, &c., from other parts of England, and 800 Scots from Scotland.

For the time of year, the supply of Sheep was very moderate. All prime breeds commanded a brisk inquiry, at an advance in the currencies of Monday last of fully 2d. per 8lbs. The general top figure for Downs was 4s. 8d., but several lots realized 4s. 10d. per 8lbs. Heavy Sheep were not so much in demand as the Down qualities.

We were fairly supplied with Calves, in which only a limited business was doing, at Friday's decline in prices.

The sale for Pigs was in a very sluggish state, at last week's quotations.

Per 8lbs. to sink the offals.

	s.	d.	s.	d.	s.	d.
Coarse and inferior Beasts	2	8	2	10	Prime coarse wool-	
Second quality do.	3	0	3	2	Prime South Down	
Prime large Oxen	3	4	3	6	Sheep	4 0 4
Prime Scots, &c.	3	8	4	0	Large coarse Calves	2 6 3
Coarse and inferior Sheep	3	4	3	6	Prime small do.	3 8 4
Second quality do.	3	8	3	10	Large Hogs	2 10 3
					Neat small Porks	3 8 3

Suckling Calves, 19s. to 23s.; and quarter-old store Pigs 17s. to 22s. each.

### THE ADVANTAGES TO BE DERIVED FROM PROVIDING ADEQUATE COTTAGE ACCOMMODATION FOR AGRICULTURAL LABOURERS.

At a late meeting of the Croydon Farmers' Club, Mr. Page, of Merton, in the chair,

Mr. CHURCHER (West Wickham) brought forward the subject of "the advantages to be derived from providing adequate cottage accommodation for agricultural labourers," as follows:—

Mr. Chairman and Gentlemen, in the first place I wish to point out the inadequate cottage accommodation for our farm labourers in this neighbourhood, and it may be the case in many other places, particularly on those farms from 200 to 600 acres. If the owners of farms were to build a cottage on every 150 acres, or contiguous to the farm, to let with it, the tenant having the control over it in letting to the labourers, the landlord and tenant would find their interests more identified. I think where cottages are so built, two good sleeping-rooms, a kitchen, washhouse with a small copper fixed, shed with an oven to supply two or more cottages, and about 20 rods of ground to each cottage for a garden, would be the best kind of cottage for farm labourers, the rent not to be more than £4 or £5 a-year. I think cottages may be so built, and pay five per cent. If so, the advantages would be great to the rising generation and to society at large—the labourer would be nearer his work, and have more leisure to cultivate his garden than having to go, as many now do, two miles in the morning to their work, and the same distance to travel back at night, which adds 24 miles walking to his other labours weekly. The next advantage would be still greater; his children would be brought up more industriously, and kept away from the temptations of the beer-shops, as he would be farther from them, and if the duty should be taken off malt and hops he would have a copper to brew his own beer, which is the national beverage, to gladden his heart after his day's toil, and to provide for the comfort of others, which every well-wisher to the labourer would be glad to see. We all know the labourer ought to live by the sweat of his brow, and if those in a higher sphere can alleviate his condition, they confer a national benefit upon society. When I go through Ad-dington, I cannot but admire the nice cottages and neat gardens belonging to his Grace the Archbishop of Canterbury; they would be a credit to any neighbourhood. I remember when Sir John Lubbock dined with the farmers at the East Surrey Agricultural Association in 1851, he advised us to

inspect Prince Albert's Model Lodging Houses, which I have done, and admire them much for their convenience, and for being well adapted for densely-populated towns, but I do not think them at all suited for agricultural districts, being too confined, and too expensively built to be let for £4 or £5 per annum. I would now say a few words upon the disadvantages of farm labourers living in cottages without gardens, where they pay 2s. 6d. or 3s. per week rent. The labourer earning 10s. a week would have but 7s. or 7s. 6d. left; but if living in a cottage on the farm it would leave him 8s., besides what his garden produces, which is a great help; but the greatest disadvantage is, that having no garden for recreation, he is induced to resort to the beer-shops, spends his money, gets in debt, and his family is often induced to follow the bad example; but if away from this temptation he would bring his family up to industrious habits. In many cottages there is not sufficient accommodation for the family to sleep, or for cleanliness, washing, &c. One means of remedying the evil would be for the principal owners of property in a parish to form themselves into a company, to purchase a piece of land and build appropriate cottages with from 15 to 25 rods of ground to each, and for the rent not to exceed £5 per annum; and that the tenants take in no lodgers without the consent of the landlords in writing; gentlemen and land-owners following either of these plans would confer a great advantage on the rising generation of labourers, and improve their condition, which would tend to do good in many ways.

Mr. STILL said he had had the cottages built, and had found it a great convenience; he had no place before for his shepherd. It was to every man's advantage to have cottages on his farm.

Mr. CRESSINGHAM thought Mr. Churcher had been very moderate in recommending one cottage to 150 acres—How many men do you think sufficient to cultivate 150 acres?

Mr. CHURCHER said two, but the proportion would depend on the number of married and single labourers.

Mr. WALKER thought there ought to be one cottage for every hundred acres, and that appeared to meet general concurrence.

The CHAIRMAN said, the necessity for more cottage accommodation was so obvious, that it scarcely required discussion, and it was the para-

mount duty of the landlord to provide it ; but the main root of the evil was the law of settlement, operating so that the landlord was rather anxious to get cottages down, to keep down the poor-rate, than to build new ones. That was the mainspring of the evil, and until that was removed little good could be done, he feared. Even this town afforded a striking illustration of the state of things produced. Many of the agricultural labourers resided here, excepting in their hours of work, knowing little of their masters, and becoming identified with the refuse of the town population. Certainly that was not the way to keep men sober and honest, because the labourer, not being able to afford a good lodging, got into a bad one, where he contracted bad habits, and became the father of a diseased offspring. The evils of the system were obvious, and it was, too, excessively unjust, for it increased the rates of one parish to a great degree, whilst it lowered those of another. It was the duty of those who legislated for them to consider how far this militated against the labourer's comforts, and, if it did, let it be done away with. It was most desirable that labourers should be lodged on the spot, not only for the convenience of the farmer, but for the comfort of the labourer. It was the more necessary to see to the comforts of the latter, because, with the increased temptations to emigration, the time was fast arriving when they might be seriously inconvenienced in cultivating the land (applause).

Mr. JOHNSON thought that objection had been removed. If a pauper belonging to one parish lived in another, his relief was chargeable to the former ; and if he became irremovable under the industrial residence clause, the burthen fell on the unions, so that landlords could not sustain the slightest injury. The building of cottages must rest with the landlord, and must very much depend on the situation people were in as to the want of labourers. If a farm was near a village, there were generally labourers enough ; whilst, if it was at a great distance, it was often very awkward to get them. He thought the evil was now curing itself. In Woldingham there were but two or three cottages in the whole parish ; they got men from the neighbouring parishes, but they now derived not the slightest benefit from that fact, which formerly perhaps they did. But that time had gone by, and certainly it would be a good thing for all parties concerned, if landowners would build cottages which would give proper accommodation to families, to let at about 2s. per week. He had seen a great many instances in which a man, with his wife and a family of boys and girls, lived in a cottage of one or two rooms only. There the children remained till they grew to manhood, being necessarily

obliged to remain in one room. Now, it was not likely that a girl brought up in that way would make a very well-conducted servant, with such a sense of propriety and good behaviour, as if she had in her youth been better and more decently lodged. And yet that was the class from which they had to obtain their servants. It was a very common thing in the parish in which he lived for cottagers, who had not half accommodation for themselves, to take in lodgers, and he did think it behoved every tenant who had the command of cottages, and every landlord who owned them, to prevent that sort of thing, and to take care, if cottages were built, that they were secured for the decent lodging of the labourers and their families. They would then be of the greatest possible service to the community (applause). Very lately he had gone to Tunbridge Wells, to look at the cottages built there by the society for the improvement of the labourers' dwellings. They were built very nicely, indeed ; but they were open to the objection Mr. Churcher had named, that was the expense. They were 3s. or 3s. 6d. a week ; that was more than the agricultural labourer could afford to pay (Hear, hear). But good cottages, with proper accommodation, might be built to let at the sum Mr. Churcher mentioned, and it would be an immense advantage to the labourers if the rising generation of landlords would take the subject into consideration, and give that accommodation which was required. On a property in this neighbourhood, of which he knew more than of any other, the cottages had been made sufficient in every instance, and no cottager was allowed to take a lodger without permission, and that permission was not given unless the family was small, so that it could be done with decency. If that was rather more generally done than it was, it would be a great benefit to all classes, for he thought the labouring class required to be considered very much in these things, and that doing so would be an advantage to us all (applause).

Mr. BROWN said, that at present, however much he might wish to engage a married man as a shepherd, he could not do so, because he had not a house for him.

The following resolution was then moved by the Chairman :—

“That it is the unanimous opinion of this club that considerable advantage to the agricultural community and the nation at large would be derived by more adequate cottage accommodation for agricultural labourers.”

Mr. CRESSINGHAM seconded, and it was carried unanimously.

## THE AGRICULTURAL DISTRICTS OF ENGLAND.

[FROM THE TIMES' COMMISSIONER.]

In our last letter we showed the advantage, both to the landlord who receives, and to the tenant who pays rent, of cultivating as much as possible that description of produce which has a tendency to increase in value in this country. We need be under no apprehension of thereby unduly diminishing the growth of corn, for the more stock an arable farm maintains, the more productive will be its yield of corn. And if corn should rise in price so considerably as to effect its comparative value, it is an easy process to extend the growth of it. With the present prices, and the knowledge of the fact that the rich corn provinces of the continent are open to us, and are daily becoming more accessible by the extension of railways and steam navigation, there seems good reason to anticipate the permanence of a low range of prices. The safe course for the English agriculturists is to endeavour, by increasing his live stock, to render himself less dependent on corn, while he at the same time enriches his farm by their manure; and is thus enabled to grow heavier crops at less comparative cost.

Before this can be done with full advantage wet land must be thoroughly drained, unnecessary obstructions to economical tillage should be removed, convenient farm-roads provided for economizing labour, and well-arranged buildings constructed for accommodating the cattle, accumulating the manure and manufacturing the crop. Let any man compare, as we have done, two farms in the same neighbourhood, the one of which is neither better nor worse provided in these respects than the average of the country, and the other with all these improvements effected and turned to account. The tenant of the first uses nearly double the quantity of seed which the second finds sufficient; for much seed perishes in undrained land, and much is carried off by the birds which harbour in straggling fences. Every operation of tillage is more difficult, and, of course, more expensive; the crop is not so good in quality nor in quantity. He has tried to grow turnips to feed stock, but the land was insufficiently prepared, and the crop a comparative failure; such as it is, it cannot be consumed where it grows, owing to the wetness of the soil; and, while the land itself is cut up, the horses are distressed in drawing it home through the miry fields; there being no proper accommodation for the cattle, the turnips are wastefully consumed, the animals do not thrive, and the manure is imperfectly made, and much of it allowed to run to waste. The other farm has been drained and trenched—the land turns up mellow and dry—it is easily and thoroughly wrought at the proper season, and the turnip-seed sown; the air and rain permeate the soil and dissolve the well-made manure; the tender rootlets of the plant find food and flourish; the crop is heavy, and does not disappoint the farmer. The land is so firm and dry that a portion of the crop is left on it to be consumed by sheep; the

sheep thrive, and enrich the ground. The rest of the crop is carried home easily on convenient roads, and given to stock, housed in well-arranged covered boxes, where warmth and shelter economise the food, and the facilities of intercommunication cheapen the cost of the attendance. The stock of all kinds thrive under this generous treatment; it is worth the farmer's while to study what is best for them, their food is given at regular intervals, roots, corn, and cake each in due proportion; they fatten rapidly—and pay. The rich manure, all of which has been safely preserved, is laid on the ground without stint. The fields are fruitful, and the farmer prosperous.

Are the men who occupy these two farms competing with each other on equal terms? Can the man who sows three bushels of wheat and reaps 24 sell it with a profit at the same price as he who sows two, and reaps 40? The man who starves his scanty stock in winter, can he profit equally with the other, whose well-fed and comfortably-lodged animals leave plenty to enrich the land and fill their owner's pocket? As well might the hand-loom compete with the power-loom, the windmill with the steam-engine, or the stage-coach with the railway.

What, then, is the actual state of England in regard to these important improvements? Drainage in the counties where it is needed has made considerable progress, the removal of useless hedge-rows is slowly extending, but farm-buildings everywhere are generally defective? The inconvenient, ill-arranged hovels, the rickety wood and thatch barns and sheds, devoid of every known improvement for economizing labour, food, and manure, which are to be met with in every county in England, and from which anything else is exceptional in the southern counties, are a reproach to the landlords in the eyes of all skilful agriculturists who see them. One can hardly believe that such a state of matters is permitted to exist in an old and wealthy country. Buildings of such a character that every gale of wind brings something down which the farmer must repair, and of so combustible a nature that among ill-disposed people he lives in continual dread of midnight conflagration,—with accommodation adapted to the requirements of a past century, the farmer is urged to do his best to meet the necessities of the present. The economics of arrangement and power, which are absolutely necessary to ensure profit amid the active competition of manufacturers, are totally lost sight of here. And even the waste of raw material, which would be ruinous in a cotton-mill, is continued as a necessary evil by the farmer, whose landlord provides him neither sufficient lodging for his stock, nor in that lodging, such as it is, the power of economizing food by warmth and shelter.

We do not advocate expensive buildings, or urge

upon landlords a heavy expenditure without a proportionate result. In many parts of the country we have seen money squandered on expensive and ill-contrived buildings, from which the tenant reaped little advantage. But, if the farmers of England are to be exposed to universal competition, the landlords must give them a fair chance. If they refuse to part with the control of their property for the duration of a lease, they must themselves make such permanent improvements as a tenant-at-will is not justified in undertaking. The farmers of that part of the continent nearest our shores have far better accommodation for their stock than the majority of English tenants. The substantial and capacious farms of Belgium, Holland, the north of France, and the Rhenish provinces, contrast most favourably with the farm buildings common in most English counties.

But how can landlords afford such an expenditure as would be required to improve their estates, and maintain and increase their value? They must make themselves acquainted first with what is absolutely requisite, and then with the best and most economical mode of carrying that into effect. The funds necessary must also be forthcoming, or rent will fall to a far greater extent than the annual amount of a sinking fund to repay this outlay.

A work so necessary could not have been so long neglected, if the great body of English landlords had been practically acquainted with the management of land. In the beginning of this century, and for 20 years afterwards, young men of family very naturally made the army their profession, and committed the management of their estates to agents, who, in those days of high prices, had little else to do than to receive rents. But that time has passed, and we trust the young men of the present generation will not be obliged to make war their profession. War prices also are gone, and the rude practice which flourished with wheat at 50s. a-quarter is altogether ruinous with wheat at 40s. The tenant may be the first to feel this change, but the landlord is the man on whom it eventually falls. Let him learn his profession—that of a landowner. He will soon discover the benefits of improvements, and therefore its necessity, the advantage of drainage, the evils of numerous hedgerows, the destructiveness of game preserves, and the economy to the farmer, and by consequence to himself, of good roads and well-arranged buildings. He will appreciate the difference between an improving tenant and a sluggard, and will encourage the one and get rid of the other. He will see the advantage of promoting the investment of capital in cultivation, and the necessity, therefore, of giving his tenant the security of a lease. He will perceive the hardship of stringent covenants to a good tenant, and their inefficiency in preventing deterioration by a bad one. And, if his estate is so extensive that his personal attention is required for public as well as private objects, his knowledge will enable him to select an agent properly qualified, whose advice he will himself be capable of estimating and controlling.

The present age is eminently practical. Every business in the country requires previous application in those who practise it, to render it profitable. The labourer must perfect himself by years of patient

application in the peculiar department of work in which he hopes to excel; the tradesman must serve his apprenticeship; the professional man must study and work hard to obtain a knowledge of his business. The success or failure of these men affects themselves only. But the landlord's influence for good or evil extends to his tenants and labourers, and, in its general results, regulates, in no unimportant degree, the productiveness and welfare of the country. Yet, of all classes in the community, he is the only one who receives no special training. He comes to the important functions of his station frequently without knowledge of its duties, and, with a consciousness of his own inability to perform them, he resigns all into the hands of his agent.

The selection of a properly qualified agent or steward is, on every large estate, a matter of the utmost importance. Honesty and uprightness are indispensable; capacity and personal activity, with an enquiring and unprejudiced mind, sound judgment, and decision of character, are all necessary. An agent should be capable of choosing a class of tenantry who would aid him in the improvement of his employer's estates; he should be able to consult with and advise them in the management of their farms, pointing out resources which they may have overlooked; he should study the proper subdivision of farms and fences, the best arrangement of farm-buildings, and the most economical mode of constructing them; he should be competent to decide on the fields that require drainage, so that, while necessary improvements are not neglected, the money of his employer may not be needlessly expended. The presence of such an agent is visible at once in the general air of comfort, activity, and progress which animates all classes connected with the estate which he superintends. Some landlords, while they admire and envy the improvements effected by such a man, yet fear to employ him, on account of the expense which his operations entail in the first instance. Expense is a comparative term. If all improvement is declined, there will, of course, be little outlay. But the most bigoted are conscious that, if rents are to be maintained, their farms must afford the same facilities to the farmer as those of their neighbours, and that progress must be made. An experienced, sensible agent, will, with the aid of a willing tenantry, make £100 go further than an inexperienced or incompetent man can effect with £200; and it is not only in this way that he economises, but by timely and wise encouragement he carries the tenantry forward in a course of improvement which enables them better to withstand the pressure of low prices of corn, by adapting their management to altered circumstances. The loss unconsciously sustained by some of the large proprietors of land in this country from the incompetence of agents is quite inconceivable. We recollect having met with a weakly old man, a retired officer, who had the management of a very extensive and valuable estate in the vicinity of a great town, which, within the last twenty years, has increased immensely in population and wealth. Dairy produce and vegetables are in great demand, and there is a cheap and abundant supply of manure. The land, considering its situation and advantages and its quality, was moderately let, and an active

tenantry should have prospered amid circumstances in every way so favourable. It would have been reasonable to expect that the rental would have been gradually creeping up, where the increasing wants of a well-employed population ought to have made itself so strongly felt. But that was not so. The tenants were hereditary, and so was the system. A certain quantity of wheat paid the rent in former times, and it ought to do so still. The supplies which were now most remunerative were furnished by others, and the men who had a market at their door for commodities which they and others within the circuit of a few miles could alone supply, continued to look almost exclusively to an article in the production of which the whole country could compete with them. The result is what, under such management, might be expected. The agent felt himself bound to recommend a reduction of rent over the whole estate some years ago, and was, at the time we saw him, again prepared to advise a second reduction; both amounting together to nearly 25 per cent. We have not a doubt that the arrangements for the gradual improvement of the agricultural management of the estate which a competent and able agent would have adopted might in this case not only have prevented any reduction in the annual value of the property, but have laid the foundation for its gradual increase, in the prosperity of an active and intelligent tenantry.

But there is one barrier to improvement which the present state of agriculture must force on the attention of the Legislature—the great extent to which landed property is encumbered. In every county where we found an estate more than usually neglected, the reason assigned was the inability of the proprietor to make improvements, on account of his encumbrances. We have not data by which to estimate with accuracy the proportion of land in each county in this position, but our information satisfies us that it is much greater than is generally supposed. Even where estates are not hopelessly embarrassed, landlords are often pinched by debt, which they would clear off if they were enabled to sell a portion, or if that portion could be sold without the difficulties and expense which must now be submitted to. If it were possible to render the transfer of land nearly as cheap and easy as that of stock in the funds, the value of English property would be greatly increased. It would simplify every transaction, both with landlord and tenant. Those only who could afford to perform the duties of landlords would then find it prudent to hold that position. Capitalists would be induced to purchase unimproved properties, for the purpose of improving them and then selling at a profit. A neglected estate would thus become a matter of choice to men of capital, and the progress of improvement would be rapid beyond precedent. A measure which would not only permit the sale of encumbered estates, but facilitate and simplify the transfer of land, would be more beneficial to the owners and occupiers of land and to the labourers in this country than any question connected with agriculture that has yet engaged the attention of the Legislature.

Nor is this matter of opinion or conjecture. We have the experience of neighbouring countries to show that their system of registering real property,

and the comparatively cheap cost of transferring it, makes it the most eligible security either for purchase or loan. The security on which a banker in Frankfort or Hamburg, as we learn from Mr. Stewart, advances money with the greatest facility and at the lowest rate of interest, is real property, whether houses or land. In this country, on the contrary, Consols are the most available security. The owner of real property who is in need of temporary assistance finds himself embarrassed at every step by technical difficulties of title and legal doubts, which compel him either to pay a high interest, or get, if he can, collateral security, or abandon the attempt altogether. These expensive, and sometimes inextricable doubts and difficulties, are the cause of the market price of land in this country being lower than on the continent, where from 30 to 33 years' purchase is said to be the common rate. Now, of all countries in the world, this, with its immense and increasing manufacturing and commercial population, its limited territory and its superabundance of capital, is the place where land should rise in relative value above all others. We have seen that the average rent of cultivated land in England has doubled within 80 years. The prospect for another period is better, from the extraordinary supplies of gold and the increasing comfort and wealth of the mass of the people. We see no reason to doubt that if the transfer of land were simplified, its value might be increased by five years' purchase, for persons seeking investment would look not merely to an immediate return, but to the certainty of a prospective increase of value which land in this country affords. A rise in value to this extent would free many an embarrassed landlord from his difficulties, and would, at all events, enable him to borrow money for the improvement of his estate on more reasonable terms. And, if many should be compelled to sell, the permanence of our national institutions and respect for the rights of property would be better insured by admitting to the class of landowners sagacious and prudent men, the architects of their own fortune, than by artificially maintaining families in a position the duties of which they cannot perform.

In the transfer of land it is necessary that the parcels be clearly identified, and any special privileges or duties attached to them intelligibly described. This and some other public objects might be accomplished by opening a record, in which any proprietor should be entitled to have his lands inserted under due precautions. An authenticated extract from this record might become the foundation of many successive transfers by short endorsements, the title being completed by the entry of these in the principal record. A system resembling this has been described to us as having long been established with success in an eastern country; and, although the question may be embarrassed with the technical refinements in which it has been enveloped, it would seem to common sense that these are not necessarily inherent in the subject. Apart from these, the chief practical difficulty would be to devise a scheme of record which would avoid repetition, and yet admit of easy reference. It might be open to those proprietors who should choose to avail themselves of its advantages, with out being compulsory upon others.



## ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

The annual meeting of this Society took place on Saturday, Dec. 11, at the Society's Rooms, Hanover Square. The chair was taken at 11 o'clock by Col. Challoner, in the absence of the President. There were present, amongst others, the following:—Col. Challoner, in the chair; Lord Camoys; Sir John Johnstone, Bart., M.P.; Mr. Fuller, M.P.; Mr. Bramston, M.P.; Hon. Spencer Stanhope; Mr. Towneley, M.P.; Rev. Jas. Linton; Dr. Somerset; Professor Simonds; Professor Way; Mr. Raymond Barker; Mr. Fisher Hobbs; Professor Sewell; Mr. Grissell, M.P.; Mr. Jennings, &c., &c.

The Secretary (Mr. Hudson) read the following report of the Council:—

## REPORT.

The Council have to lay before the Members at the present General Meeting of the Society, the following half-yearly report of their proceedings.

Since the last General Meeting in May, 45 Members have been lost to the Society by death, and the names of 82 others have been removed from the list on retirement or otherwise; while 80 new Members have been elected during the same period. The Society accordingly now consists of—

91 Life Governors,
149 Annual Governors,
720 Life Members,
3,955 Annual Members,
19 Honorary Members.

making a total of 4,931. In the list of deceased Members on this occasion, there occurs the illustrious name of the Duke of Wellington, one of the earliest Life-Governors and Vice-Presidents of the Society; who, though not himself a practical farmer, took a lively interest in everything tending to develop the resources of his country. In filling up the vacancy thus occasioned in the list of the Vice-Presidents, the Council have elected Sir John V. B. Johnstone, Bart., M.P., to that office; a gentleman who from the earliest period of the Society has given his unremitting attention to its affairs. They have also placed among the general Members of Council, in the vacancy thus occasioned by the transfer of Sir John Johnstone's name to the list of Vice-Presidents, the name of Mr. Francis Woodward, of Worcestershire; one of those intelligent practical agriculturists to whom the Society owes so much of its public utility, and also one of the oldest members residing in the district of the ensuing year's country meeting.

The Finances of the Society are in a satisfactory condition, as is shown by the Auditors' Balance-Sheet to the 30th of June last; since which time the Finance Committee have reported, that all claims against the Society submitted to them up to their last meeting had been discharged, and that the funded property invested in the names of the Trustees of the Society now stands at £9,990 Stock.

The Council receive with satisfaction the testimony of the Members to the still increasing value of the Society's *Journal*, and to the immediate and extensive influence resulting from the almost simultaneous transmission of the copies, free through the post, to the numerous Members of the Society diffused throughout the kingdom; as well as to that secondary and local influence arising from a knowledge of the facts and practical statements in its pages, personally communicated by each member to other parties residing within the sphere of his own particular neighbourhood.

The Chemical Investigations continue to be steadily pursued by Professor Way, with valuable results obtained at each stage of his inquiries, leading on step by step through the labyrinth of nature's operations to new discoveries of the machinery by which she works in secret, and to the prospect of entirely new applications in the economy of agricultural laws for the cultivation of the soil and the manuring for crops. The Society have also been indebted to Professor Way for an interesting and valuable lecture, delivered by him before the Members, during the past half-year, on the elucidation of Jethro Tull's principles of agriculture by modern science, and their illustration by modern facts.

The Council have on former occasions reported to the Society the communications in which they have been placed with the Foreign Office in reference to the question of a reduction in the price of Guano. They have now to report, that they appointed in June last a Deputation to wait on the Earl of Derby, the Prime Minister, for the purpose of representing to him the great importance of every means being taken to effect this object. His lordship received the Society's Deputation most courteously, and assured them of his desire to take every measure that might at any time be in his power to promote the views and wishes of the Society on this subject. Since that interview the Council have resolved to offer, in addition to their current prize of £50 for an essay on the geographical discovery of new supplies of Guano, a prize for the discovery of a substitute for Peruvian Guano, under the following terms and conditions:—

## I.—TERMS OF THE PRIZE:

“ONE THOUSAND POUNDS and the GOLD MEDAL of the Society will be given for the discovery of a Manure equal in fertilising properties to the Peruvian Guano, and of which an unlimited supply can be furnished to the English Farmer at a rate not exceeding Five Pounds per ton.”

## II.—CONDITIONS OF COMPETITION:

1. That in the offer of £1,000 and the Gold Medal of the Society, as a Prize for the discovery of a manure equal in every respect in its fertilising properties to Peruvian Guano, the £1,000 shall be offered in one undivided sum.

2. That the standard of such Peruvian Guano shall be assumed to be the average result obtained by Prof. Way, the Consulting-Chemist to the Society, and published in his paper in the 10th volume of the *Journal*, pages 205—208.

3. That each competitor claiming the prize shall send in

with his sample a chemical analysis under seal, together with such practical proofs of the successful application of the manure to growing crops of grain, roots, and grasses, as he can produce duly certified by growers. That such samples of manure shall be liable to be subjected to all such further tests, and for such period of trial, as the Council may deem requisite.

N.B.—All claimants shall, on application made to them by the Secretary, be expected to supply, free of expense to the Society, such quantity of their respective manures as may be required for trial.

4. That no claim for the Prize will be entertained unless the claimant can satisfy the Council that an unlimited supply of the manure at a price not exceeding £5 per ton, will at all times be within the reach of the agriculturists of the United Kingdom.

The Council have already reason to believe that the attention which this prize will call to the whole economy of manuring, and to the agricultural as well as sanitary question of the manurial resources of the kingdom, will lead to new and important results.

The Council, after full deliberation upon the following amended Conditions, proposed to them by their Veterinary Committee, and which have been accepted by the College, decided last month to renew the grant of £200 for the current year to the Royal Veterinary College:—

1. That Members of the Society shall have the privilege of sending cattle, sheep, and pigs to the Royal Veterinary College on the same terms as if they were Members of the College.
2. That the College shall investigate particular classes of diseases or subjects as may from time to time be directed by the Council.
3. That, in addition to the increased number of lectures given by Prof. Simonds, the Lecturer on Cattle Pathology, to the Pupils in the College, he shall also deliver lectures in the Council Room before the Members of the Society.
4. That the College shall supply a detailed Report of the cases of cattle, sheep, and pigs treated in the Royal Veterinary College.

The Council have had their attention called by His Royal Highness Prince Albert to the process of inoculation so extensively carried on at the present time in Prussia, Belgium, and the Netherlands, with a view to modify the severity of the symptoms of pleuro-pneumonia in cattle. In consequence of the information furnished by His Royal Highness to the Council, they authorised Professor Simonds, as the Veterinary-Inspector of the Society, to proceed to Belgium, in August last, for the purpose of making himself personally acquainted with the facts connected with the conditions and results of the employment of this process. The Report which Professor Simonds has made to the Council on this visit of inspection will appear in the next part of the Society's *Journal*, along with a second report on the occurrence of pleuro-pneumonia in the extensive herd of dairy cows belonging to Mr. Paget, of Ruddington Grange, near Nottingham, and which that gentleman has with great liberality placed at the disposal of the Society for any experiments the Council may direct to be made on them. Professor Simonds has accordingly selected a certain number of animals for the purpose of experiment at Ruddington, and a further number to be brought up to the Royal Veterinary College in London for experiment under his own immediate superintendence. The Council have expressed to Mr. Paget their warmest thanks for the invaluable opportunity he has thus afforded to the Society, of having direct investigations most satisfac-

torily made on the nature and cure of this fatal malady. The Council have also been favoured by Lord Stanley, H.M. Under-Secretary of State for the Foreign Department, Sir Emerson Tennent, Secretary to the Board of Trade, and Dr. Willems, of Hasselt, in Belgium, with communications on this subject.

The Country Meeting of the Society at Lewes in July last was in every respect satisfactory, excepting in the number of visitors, which, although amounting to 18,000 in the Show-yard, and 500 at the Pavilion Dinner, was only one-half of the usual number. This comparatively deficient attendance, however, was owing to peculiar circumstances, over which the Society had no control: namely, a remote locality, unusually oppressive heat, and a general election going on throughout the country at the very time of the Meeting. The reports of the Senior Stewards of Live Stock and Implements respectively at that Meeting will appear in the Society's *Journal*. The thanks of the Society were voted at the time to the Authorities of the Borough, to the Railway Companies, and to Professor Simonds, who delivered before the Members an interesting lecture on Parasitical Insects producing internal and external disease in the live stock of the farmer.

The Council have decided that the Gloucester Meeting for the South Wales district shall be held in that city in the week commencing Monday, the 11th of July. They have decided on the Prizes to be offered for Live Stock, and for the Prizes and Conditions of Implements for that occasion, deferring until after Christmas the final arrangements for the Poultry Prizes. They have also decided on the prizes to be offered for the Essays and Reports of next year. They have agreed to the arrangements for preparing the land for the trial of Implements, and have accepted the offer of the Contractor of Works to undertake their execution at the same rate of charge as in former years. They have received from the Professors at the Royal Agricultural College, at Cirencester, the offer of co-operation in any way by which their services may be thought, by the Council, best to promote the objects of the Society at the Gloucester Meeting.

In order to consider the most effectual means of obviating the over-feeding of live stock for breeding purposes exhibited at the Country Meetings of the Society, the Earl of Ducie, as its late President, undertook, after the Lewes Meeting, the task of entering into communication with the greater number of those gentlemen who had acted as Judges at the former Country Meetings of the Society, and the great majority of their opinions being in favour of decisive measures to put a stop to an evil so generally complained of, a committee was appointed, who have made the following recommendations, which have been since adopted by the Council:—

1. To appoint three Juries of Condition for the three divisions of (1) Cattle, (2) Sheep, (3) Horses and Pigs; each Jury to be drawn by lot by the Steward of each division from the whole of the Judges comprised in it, and to consist of 9 Judges and 1 Steward: the Steward himself not to vote, but to take the decision in each case by a show of hands, the majority of votes to decide.
2. The following notice to be printed in red ink at the foot of each Certificate of entry: namely—"All animals sent

for exhibition which shall in the opinion of the Jury be in an over fed condition will be disqualified by the Jury before inspection by the Judges:—and a placard to be placed over the standing of every animal that shall be so disqualified, stating the reason of such disqualification.

3. The age of Bulls in the two classes of each division of cattle not to exceed four years and two years respectively on the 1st of July in the year of show for which they are entered.
4. No Bull in Class I. of each division of cattle to be eligible for a prize unless a certificate is produced of his having served not less than three different cows within the three months preceding the 1st of June in the year of the show.
5. No alteration to be made in the limit of age for Cows; but that every Cow in-milk and not in-calf must be certified to have had a live calf within the twelve months preceding the date of the show.
6. No Heifer entered as in-calf to be eligible unless certified to have been bulled before the 1st of March in the year of show, and not to have been again in bulling subsequently to that date; nor her owner afterwards to receive the prize, unless on the production of a further certificate that she has produced a live calf before the 1st of February ensuing.
7. No Cattle or Sheep to have been fed with milk subsequently to the 1st of January in the year of the show.
8. No Boar or Sow to be shown that cannot walk on account of over-fatness.

The District for the Country Meeting in 1856 has been determined to consist of the counties of Huntingdon, Cambridge, Bedford, Buckingham, Hertford, and Essex.

The Council have the continued satisfaction of referring to the successful manner in which the practical operations of agriculture are directed by improved principles gradually adapted to each particular case by an extended knowledge of conditions; and of witnessing the same spirit of improvement that has so long sustained and encouraged the Society in the prosecution of its objects, now animating other agricultural communities in every part of the civilized world, and leading them to find their mutual advantage in friendly communication and the interchange of scientific and practical results.

By order of the Council,

JAMES HUDSON, Secretary.

London, Dec. 1st, 1852.

Mr. C. TOWNLEY said he had been requested to move the adoption of the report, and he was perfectly willing to do so, as that document showed that the Council had been actively endeavouring to promote the objects of the Society, and to extend its usefulness throughout the country. If he might be allowed to make one or two remarks, he would observe that he thought the determination of the Council with regard to the jury for cattle would prevent numbers from exhibiting. To him it appeared impossible to declare what was the state to which a breeding animal should be brought. He had himself a cow which he could not keep thin, and he was obliged to keep her in the house instead of the field. He thought that, provided an animal were a *bona fide* breeding animal, it would be very difficult for the jury to decide precisely what amount of fat there should be. As he did not belong to the Council, the only course open to him was thus to bring this subject before the meeting; but he had no hesitation in moving the adoption of the report.

The Rev. JAMES LINTON felt great pleasure in seconding the adoption of the admirable report that had just been read by their able Secretary; and he would be deficient in proper respect for the Council if he did not

tender his own thanks, and he thought he might couple with them those of the Society, to the Council, for their indefatigable exertions; for it was entirely owing to those exertions that the Society had attained the pre-eminent position it now occupied. There were one or two points in the report which appeared to him especially deserving of acknowledgment. For the course which they had taken on the guano question the Council were eminently entitled to their gratitude. The Council had, by all the means in their power, endeavoured to induce the authorities of this realm to intercede with the authorities of Peru to allow guano to be imported into this kingdom at a less exorbitant rate. He thought, too, that in offering a prize to any person who should discover a substitute for guano, equal to it both in quality and quantity, and procurable at half the price of guano—whether they succeeded or not in their laudable attempt, he thought the Council deserved the warmest thanks of the Society. If they did not succeed, he could not help thinking that in these times of unrestricted competition ships might be equipped, to be sent out to the Lobos Islands, and help themselves (laughter). But in that the Council would take no part. (Hear, hear.) They had endeavoured to frustrate the monopoly of Peru by legitimate means, and not by infringing the law of nations. (Hear, hear.)

The motion was then agreed to.

Mr. R. BARKER read the following cash statement:

HALF-YEARLY ACCOUNT ENDING THE 30TH JUNE, 1852.

RECEIPTS.		£	s.	d.
Balance in the hands of the Bankers, 1st Jan., 1852	.. .. .	1,020	8	11
Balance of Petty Cash in the hands of the Secretary, 1st Jan., 1852	.. .. .	29	13	11
Dividends on Stock in the Three and-a-Quarter per Cents	.. .. .	176	10	11
Life Compositions of Governors	.. .. .	189	0	0
Life Compositions of Members	.. .. .	230	0	0
Annual Subscriptions of Governors	.. .. .	515	0	0
Annual Subscriptions of Members	.. .. .	2,229	7	0
Receipts on account of <i>Journal</i>	.. .. .	199	2	6
Receipts on account of Country Meetings	.. .. .	1,518	10	0
		£6,137	13	3

THOS. RAYMOND BARKER, Chairman } Finance  
 THOMAS AUSTEN } Committee.  
 C. B. CHALLONER }

PAYMENTS.		£	s.	d.
Permanent Charges	.. .. .	170	12	6
Taxes and Rates	.. .. .	13	19	5
Establishment	.. .. .	593	0	8
Postage and Carriage	.. .. .	23	13	6
Advertisements	.. .. .	5	1	6
Payments on account of <i>Journal</i>	.. .. .	1,365	0	7
Veterinary Grant—one year	.. .. .	200	0	0
Chemical Grant—half-a-year	.. .. .	100	0	0
Chemical Investigations—one-third of a year	.. .. .	100	0	0
Prize Essays	.. .. .	130	0	0
Payments on account of Country Meetings	.. .. .	572	11	1
Transfers of Subscriptions	.. .. .	23	2	0
Sundry items of Petty Cash	.. .. .	2	15	10
Balance in the hands of the Bankers, 30th June, 1852	.. .. .	2,822	19	6
Balance of Petty Cash in the hands of the Secretary, June 30, 1852	.. .. .	14	16	8
		£6,137	13	3

Examined, Audited, and found correct this 10th day of December, 1852.

G. I. RAYMOND BARKER } Auditors on the part of  
 GEORGE DYER } the Society.

Mr. Barker invited comment on the items, but none was made.

The Hon. SPENCER STANHOPE moved a vote of thanks to the auditors, for their care in auditing the accounts.

The motion was seconded by Mr. Fuller, M.P., and adopted.

Mr. DYER, one of the auditors, returned thanks.

The following gentlemen were then re-elected auditors: Mr. R. Barker, Mr. Knight, and Mr. Dyer.

Mr. W. TORR moved a vote of thanks to Professors Way and Simonds for their valuable lectures. The benefit of those lectures was not confined to those who heard them, but through the Journal of the Society and the public press the information conveyed in them was conveyed through the length and breadth of the land. Although it was clear that a purely scientific farmer must cut a poor figure in the present day, it was equally clear that a good practical farmer might be rendered a still better farmer by the knowledge of the scientific principles on which his operations ought to be conducted. He thought, therefore, the Society was very much indebted to its Professors for the scientific knowledge which they gave the practical farmer (Hear, hear).

Mr. W. JONES seconded the motion, which was then carried.

Professor WAY felt exceedingly obliged to the meeting for the compliment which had just been awarded. All he could say was, that both his own services and those of Professor Simonds would, he hoped, always be rendered willingly; and for himself he would say that whilst the pursuit of those subjects which bore upon the daily life of the agriculturist must necessarily be expected by practical men to yield practical results, and whilst it was pretty well known that these results must be exceedingly slow, his best encouragement to proceed was the confidence shown by a Society like that, and the kindness with which his efforts were accepted (cheers).

Professor SIMONDS did not know that he could add anything, unless it were to say that, in the relation in which he stood to the Royal Veterinary College, he felt it his duty to do all in his power to promote the interests of this Society. He had thought from the commencement that they had nothing to gain by hiding their knowledge under a bushel; but that they would best advance the interest of the Society to which they belonged, while at the same time they promoted the cause of agriculture, by giving the greatest publicity to the knowledge of those principles which guided them in reference to the diseases of animals. (Hear, hear). He felt perfectly sure that those who took a contrary view were mistaken, and that they would discover ultimately that their view was fallacious. Many veterinary surgeons had thought that by making agriculturists their own cattle doctors they would injure their profession. His reply to that argument was that farmers were continually complaining of want of knowledge, and that he believed that in many cases ignorance prevented them from applying to those who really possessed knowledge. He need not say that the pursuit of an opposite course to that which he had advocated nearly led at one period to a severance between that Society and the Royal Veterinary College. That, however, had passed away, and he was now able to offer his sincere congratulations upon the good understanding and harmony which existed between the two bodies.

The CHAIRMAN said, the business having terminated, it now became his duty to ask whether any gentleman wished to put any question to the Council, or to make any remark for its consideration and guidance?

Mr. C. TOWNELEY begged to take the liberty of renewing the subject of the fattening of animals. He certainly thought the new regulation would tend to

prevent the exhibition of many excellent animals. He had a cow which had won the first prize at many agricultural meetings, and which had twice gained the gold medal of the Royal Agricultural Society, and that animal might, nevertheless, be objected to as being over-fed. She was an excellent *bona fide* breeding animal; but, notwithstanding that, it was a question in his own mind whether he should not show it at the next annual meeting of the Society. He must say that he much regretted the decision of the Council on that subject.

Mr. FULLER, M.P., wished to mention a rather curious case. A bull, which he sent recently to London, became unwell. No one could tell what was the matter with him; but, on the farrier's recommendation, he was killed. There were found on his chest six pailfuls of water, and the lungs were quite wasted. The farrier, who was a very old man, said he had never met with such a case before; but the butcher by whom the animal was killed said he had known several such cases, and that the disease was very infectious. The honourable member for Shropshire, too, Mr. Clive, told him that it was infectious, and added, that when any such complaint arose the animal should immediately have hot brandy and water (laughter).

Mr. R. BARKER said, having been chairman of the Veterinary Committee, he felt it his duty to make one or two observations in reply to Mr. Towneley. The Council would greatly regret that gentleman's being induced to withhold the exhibition of his stock, because there was every reason to believe that his animals had hitherto had most fair and proper treatment up to the time of their arrival at the yard; and they would be very happy to see him a successful competitor in future. It was desirable, however, that the object of the Council should be clearly understood. From the commencement it had been an instruction to the judges that they should award prizes for the value of animals as breeding stock, and not for their value to the butcher; but in no instance had animals been excluded from competition. It was perfectly well known that in more classes than one animals exhibited were perfectly useless as breeding stock, and the object of the Council was to prevent such a state of things from continuing.

Mr. GRISELLE thought that, although Mr. Towneley might suffer individually, the public generally would benefit greatly by the new regulation. It was, he thought, universally felt that animals of all descriptions had been very much overfed; and it was a crying evil that the competition was not fair, because persons were permitted unduly to fatten their cattle. Before sitting down, he wished to make a remark on the guano question. He quite felt the importance of discovering something resembling guano, which could be sold at a cheaper rate; but they should not shut their eyes to the fact that they had very good manure within their reach, if they could but make use of it. The other day, being upon the Sheffield and Lincolnshire Railway, he was astonished to find that there was an enormous train of trucks belonging to the Corporation of Manchester, which was constantly engaged in conveying the offal and manure of Manchester to the low lands of the county of Lincoln. If the corporation of London and the other metropolitan authorities would only adopt a similar plan, the sweepings of the metropolitan streets might be conveyed east, west, north, and south with immense benefit both to agriculturists and to the whole community.

Mr. FULLER, M.P., said he sent a bull to Lewes. It had gained a prize before, and on this last occasion he was told that the only fault was that it was fat enough.

Mr. W. F. HOBBS said, as an agriculturist and as a member of the Council, he felt obliged to Mr. Towneley

for having brought forward this subject. The Council had paid the greatest attention to the matter for years past, but had found great difficulties attending it. It was very desirable not to impose unnecessary restrictions; but, having regard to the complaints which had been made of the over-fatness of animals year after year—many of the exhibitors having shown stock more fit for the Smithfield show—yard than for that of the Royal Agricultural Society—the Council thought it best to adopt the only plan which appeared practical in order to check the continued exhibition of these very fat animals in a yard intended for breeding stock (Hear, hear). If he were still a breeder of stock he would not fear to pass through the ordeal of the judges (Hear, hear). Great difficulties had arisen heretofore from the fact that the judges did not like incurring the odium of rejecting animals, even though they did not approve of them. He believed that the judges would perform their duty under the new arrangement in a satisfactory manner; and were he one of them, supposing an animal not to have been fed with milk, meal, or oil-cake, he would certainly not reject him on account of his being properly fattened.

Mr. TOWNLEY said it would be open to a fraudulent breeder to conceal his mode of feeding. He did not believe his cow had ever had meal, oilcake, or anything of the kind.

The Rev. J. LINTON highly approved of the new regulation, and was convinced that it would be productive of great benefit.

A MEMBER asked whether, if a heifer had been rejected on account of having too much fat, there would be any tribunal of appeal.

Mr. R. BARKER replied that there would not. He could not help mentioning that one of the most eminent stock breeders in the midland counties told him that, having wondered that he did not gain prizes like others, on inquiry he found the reason to be that he did not give his animals milk up to the last minute; and upon adopting that practice he obtained nearly all the prizes (Hear, hear). It was not the intention of the Society merely to encourage the feeders of stock.

Mr. TOWNLEY thought that heifers, in order to obtain the prize, should have a live calf.

Mr. R. BARKER said that was included in the conditions.

Mr. BULLEN (from Ireland) mentioned the case of a celebrated heifer in that country which obtained several prizes at agricultural shows; and with respect to which, after the prize had been awarded at Cork on the supposition of her being in calf, it was discovered that she did not calve, and she had never calved since.

Mr. W. F. HOBBS, in reply, said the committee had recommended the Council to encourage the exhibition of young animals, and to allow no bull to be exhibited after it was four years old. With regard to cows, the regulation was that a cow must have produced a live calf within twelve months. The prize would not be given for heifers unless they produced a live calf before the 1st of February succeeding the show. All such points had been duly considered, and he hoped the arrangement would, in spite of difficulties, receive the approval of most practical men.

The subject then dropped.

On the motion of Lord CAMOYS, seconded by Mr. S. Druce, a vote of thanks was voted to the Chairman.

The CHAIRMAN, after expressing his acknowledgements, said that he was glad that his friend Mr. Townley had brought forward the subject that he had done; for, though he did not agree with him in any one point that he had advanced (laughter), he considered it useful to have the opinions of practical men elicited (Hear, hear). As regarded manure, unless landlords provided their tenants with tanks and other conveniences for its

preservation, there was little chance of its being turned to the best account. In conclusion, he observed that, as one of the oldest members, he was exceedingly glad to perceive that the Society was progressing, not only as a society, but also in public opinion.

The meeting then separated.

A MONTHLY COUNCIL was held at the Society's House in Hanover-square, on Wednesday, the 1st of December. The following members of Council and Governors of the Society were present: Lord Ashburton, President, in the chair; Sir John Villiers Shelley, Bart., M.P.; Sir Charles Lemon, Bart., M.P.; Col. Austen; Mr. Raymond Barker; Mr. Barnett; Mr. Hodgson Barrow, M.P.; Mr. Brandreth; Mr. Burke; Captain Stanley Carr; Mr. W. G. Cavendish; Colonel Challoner; Mr. Evelyn Denison, M.P.; Mr. Brandreth Gibbs; Mr. Grantham; Mr. Fisher Hobbs; Mr. Hornsby; Mr. Lawrence; Mr. Marshall, M.P.; Mr. Milward; Mr. Mainwaring Paue; Professor Sewell; Professor Simonds; Mr. Simpson; and Professor Way.

FINANCES.—Mr. Raymond Barker, Chairman of the Finance Committee, laid before the Council the monthly report on the accounts of the Society, from which it appeared that the current cash balance in the hands of the bankers was £935.

PLEURO-PNEUMONIA.—Mr. Raymond Barker, as Chairman of the Veterinary Committee, then laid before the Council the following report connected with inquiries on the subject of inoculation for pleuro-pneumonia, and direct investigations into the nature and cure of that fatal disease:—

The Veterinary Committee have had under their consideration the various communications referred to them by the Council. They beg to offer the following recommendations:—

1. That Professor Simonds be allowed the personal expenses incurred by him during his recent journey into Belgium, undertaken for the purpose of making himself acquainted, as the Veterinary-inspector of the Society, with the actual facts of the process of inoculation, reported to be actively in operation on the dairy cattle of that kingdom, with a view to mitigate the severity of the symptoms of pleuro-pneumonia so prevalent at the present time in various parts of the continent.
2. That Mr. Paget's handsome and liberal offer to place his entire herd of dairy-cows in Nottinghamshire at the disposal of the Society for direct experiments, to be instituted for the Society in that county, and also at the Royal Veterinary College, be accepted with the best thanks of the Council; and that the Society bear the charge of bringing up to town and keeping such animals as may be selected for the proposed experiments.

Mr. Barker explained that Prof. Simonds' Report of his visit of inspection into Belgium had been ordered by the Journal Committee to be printed for insertion in the forthcoming part of the Journal of the Society; and that Prof. Simonds had that morning delivered to the Secretary a report on his examination of Mr. Paget's herd, and of his selection of animals for experiment, which would then be read to the Council and afterwards referred in like manner to the Journal Committee. This report having been read accordingly, Mr. Denison, M.P., favoured the Council with a statement of the circumstances under which his friend Mr. Paget had applied to him on this subject, and consented to place his animals at the disposal of the Society. On the motion of Mr. Denison, seconded by Sir John Shelley, the Council agreed to a vote of their warmest thanks to Mr. Paget for this instance of his great liberality to the Society, in affording it so invaluable an opportunity of investigating under the most favourable circumstances the nature and progress of this fearful malady.

GUANO-SUBSTITUTE PRIZE.—Sir John Shelley, Bart., M.P., brought up from the Guano-substitute Committee

the following Report of that Committee on the conditions recommended to be adopted for the Society's Prize, and agreed to at a meeting of the Committee held on the 10th of November last, of which Sir John Shelley was the Chairman: namely,—

#### I.—TERMS OF THE PRIZE.

"ONE THOUSAND POUNDS and the GOLD MEDAL of the Society will be given for the discovery of a manure equal in fertilizing properties to the Peruvian Guano, and of which an unlimited supply can be furnished to the English farmer at a rate not exceeding 5*l.* per ton."

#### II.—CONDITIONS OF COMPETITION.

1. That in the offer of £1,000 and the Gold Medal of the Society, as a prize for the discovery of a manure equal in every respect in its fertilizing properties to Peruvian guano, the £1,000 shall be offered in one undivided sum.
2. That the standard of such Peruvian Guano shall be assumed to be the average result obtained by Prof. Way, the Consulting-Chemist to the Society, and published in his paper in the 10th volume of the Journal, pages 205-208.
3. That each competitor claiming the prize shall send in with his sample a chemical analysis under seal, together with such practical proofs of the successful application of the manure to growing crops of grain, roots, and grasses, as he can produce duly certified by growers. That such samples of manure shall be liable to be subjected to all such further tests, and for such period of trial, as the Council may deem requisite.—N.B. All claimants shall, on application made to them by the Secretary, be expected to supply, free of expense to the Society, such quantity of their respective manures as may be required for trial.
4. That no claim for the prize will be entertained unless the claimant can satisfy the Council that an unlimited supply of the manure at a price not exceeding 5*l.* per ton, will at all times be within the reach of the agriculturists of the United Kingdom.

The Report was unanimously confirmed and adopted by the Council.

**GLOUCESTER MEETING.**—The Earl of Ducie, chairman of the General Gloucester Committee, transmitted to the Council the following report.

The General Gloucester Committee have to report to the Council:—

1. That every arrangement has been completed for the preparation of the land for the trials of implements at the ensuing country meeting.
2. That Mr. Henry Manning's offer to undertake the contractor's work at Gloucester at the same rate of charge as in former years has been accepted.
3. That the period for holding the Gloucester meeting be fixed as the week commencing Monday, the 11th of July, 1853.

This Report was received and adopted.

**TRIAL OF IMPLEMENTS.**—Colonel Challoner, chairman of the Implement Committee, laid before the Council the following Report, which was adopted by the Council.

The Committee have had referred to them by the Council the consideration of the Conditions and Regulations of the Gloucester Implement Prize Sheet, and a special instruction on the best means for enforcing greater punctuality in the presentation of the judges' reports at the conclusion of the business of each country meeting.

The Committee have in the first instance confined their attention to the consideration of the CONDITIONS of the Prizes; and they accordingly recommend the adoption of the conditions of last year with the following alterations:—

1. That in adjudicating the relative merits of the drills for general purposes, and the Turnip drills for flat and ridged work, especial consideration shall be given to their power of depositing small and large quantities.
2. That in adjudicating on the merits of the portable steam-engines, reference shall be had to the portability of the engines, without losing sight of the strength required for safety, and which, in the opinion of the committee, will be best secured by the free use of wrought-iron in lieu of cast.

3. That every exhibitor of drain-tile or pipe-machines will be expected to bring with him a die 2½ inches in diameter, and a button or triblet of two inches in diameter, with dies of other sizes varying from 1 to 4 inches, or larger, and buttons or triblets of corresponding dimensions.

The Committee beg to recommend that in future the trial of the steam-engines be commenced one day earlier; and that the following special regulation be included in the prize-sheet—namely:

Exhibitors are requested to be in attendance during the trials, and in the implement-yard, while the Judges are inspecting the implements, in case any explanation may be required from them; and they or their servants must give every facility to the Stewards and Judges, by having their implements ready for inspection and trial; and any exhibitor, after having had due notice, will be liable either to have his implement tried at his own risk, in his absence, or to have it removed altogether from the show, as the Stewards may decide, and without any responsibility attaching to the Society in consequence.

The Committee think it will be desirable to postpone the consideration and final settlement of the General Regulations of the Show, and the Instructions for the Judges and Stewards, until the monthly meeting of the Council in February.

**VICE-PRESIDENT.**—On the motion of Mr. Raymond Barker, seconded by Sir John Shelley, Bart., M.P., the vacancy occasioned in the list of the Vice-Presidents of the Society by the death of his Grace the Duke of Wellington, was filled up by the unanimous election of Sir John V. B. Johnstone, Bart., M.P., to that office.

**MEMBER OF COUNCIL.**—In the absence of the Hon. R. H. Clive, M.P., Mr. Raymond Barker moved the resolution of which Mr. Clive had duly given notice—that Mr. Francis Woodward, of Little Comberton, near Pershore, Worcestershire, be elected one of the General Members of Council, in the vacancy created by the transfer of any name from that list to the list of Vice-Presidents; which, being seconded by Mr. Fisher Hobbs, was carried unanimously, and Mr. Woodward's name was placed accordingly in the list of the Council, in the vacancy created by the election of Sir John Johnstone to a Vice-Presidency.

**STEWARD OF CATTLE.**—On the motion of Mr. Milward, seconded by Mr. Brandreth, Mr. William Simpson was unanimously chosen one of the stewards of the cattle yard at the country meetings of the Society, in the place of Mr. Samuel Jonas, who retires this year by rotation.

**STANDING COMMITTEES.**—The following standing committees for the year 1853 were agreed to:

**Finance Committee.**—Col. Austen, Mr. Raymond Barker, Mr. H. Blanshard, Mr. Brandreth, Colonel Challoner, Mr. Jonas, Mr. Wilson.

**House Committee.**—The President, Chairman of Finance Committee, Sir John Villiers Shelley, Bart., M.P., Mr. Raymond Barker, Mr. Brandreth, Colonel Challoner, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Kinder.

**Journal Committee.**—Mr. Pusey (Chairman), Duke of Richmond, Lord Braybrooke, Lord Portman, Hon. R. H. Clive, M.P., Sir John V. Shelley, Bart., M.P., Sir C. Lemon, Bart., M.P., Sir John V. B. Johnstone, Bart., M.P., Mr. Burke, Mr. Childers, Mr. E. Denison, M.P., Mr. Hyett, Mr. Miles, M.P., Mr. Milward, Mr. Shaw, Mr. Thompson.

**Chemical Committee.**—Mr. Pusey (Chairman), Lord Portman, Sir John V. B. Johnstone, Bart., M.P., Mr. Dyke Acland, Dr. Daubeney, Mr. Hoskyns, Mr. Hudson (of Castlecre), Rev. A. Huxtable, Mr. Hyett, Mr. Jonas, Mr. Lawes, Mr. Miles, M.P., Mr. J. M. Paine, Mr. Shaw, Mr. Sheridan, M.P., Mr. Thompson.

**Veterinary Committee.**—Mr. Raymond Barker (Chairman), Duke of Richmond, Lord Portman, Sir John V. Shelley, Bart., M.P., Sir J. V. B. Johnstone, Bart., M.P., Mr. S. Bennett, Mr. Brandreth, Col. Challoner, Mr. E. Denison, M.P., Mr. Brandreth Gibbs, Mr. Hamond, Mr. Fisher Hobbs, Mr. Miles, M.P., Mr. Milward, Mr. Pym, Prof. Sewell, Mr. Shaw, Prof. Simonds, Prof. Spouner, Mr. Thompson.

*General Gloucester Committee.*—Earl of Ducie (Chairman), Duke of Richmond, Earl of Chichester, Lord Portman, Hon. R. H. Clive, M.P., Sir John V. Shelley, Bart., M.P., Sir M. W. Ridley, Bart., Sir J. V. B. Johnstone, Bart., M.P., Col. Austen, Mr. Raymond Barker, Mr. Barnett, Mr. Brandreth, Col. Challoner, Mr. Gibbs, Mr. Hamond, Mr. Fisher Hobbs, Mr. Hudson (of Castleacre), Mr. Jonas, Mr. Jones, Mr. Lawrence, Mr. Milward, Mr. Pusey, Mr. Shaw, Mr. Simpson, Mr. Woodward.

*Implement Committee.*—Colonel Challoner (Chairman), Earl of Ducie, Lord Portman, Sir John V. Shelley, Bart., M.P., Sir M. W. Ridley, Bart., Mr. Brandreth, Mr. Garrett, Mr. Gibbs, Mr. Hamond, Mr. Fisher Hobbs, Mr. Hornsby, Mr. Miles, M.P., Mr. Shaw, Mr. Thompson.

*Guano-substitute Committee.*—Earl of Ducie (Chairman), Hon. R. H. Clive, M.P., Sir John Villiers Shelley, Bart., M.P., Mr. Raymond Barker, Colonel Challoner, Mr. Hamond, Mr. Fisher Hobbs, Mr. Hudson (of Castleacre), Mr. Shaw, Mr. Thompson, Mr. Pusey.

*Fat Cattle Committee.*—Earl of Ducie (Chairman), Lord Berners, Sir John V. Shelley, Bart., M.P., Mr. Barnett, Mr. Bennett, Mr. Brandreth, Mr. Druce, Mr. Gibbs, Mr. Fisher Hobbs, Mr. Kinder, Mr. Milward, Mr. Shaw, Mr. Simpson, Mr. George Turner.

*Fines Committee.*—Earl of Ducie (Chairman), Mr. Barnett, Mr. Brandreth, Colonel Challoner, Mr. Druce, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Jonas, Mr. Milward, Mr. Shaw, Mr. Simpson.

**FINES.**—The report on fines incurred for 1853-exhibition at the Lewes meeting was referred to the Fines' Committee.

**INTERNATIONAL POSTAGE.**—A communication from the International Postage Association was referred or consideration to the next monthly Council.

The Council then adjourned to their weekly meeting for practical communications and discussions, to be held on Wednesday next, at which, as usual, all members of the Society would have the privilege of attending.

A WEEKLY COUNCIL was held at the Society's House, in Hanover-square, on Wednesday, the 8th December; present, Mr. PUSEY, Trustee, in the chair; Lord Berners, Hon. R. H. Clive, M.P., Sir John Villiers Shelley, Bart., M.P., Sir Robert Price, Bart., M.P., Sir Digby Neave, Bart., Colonel Austen, Mr. Raymond Barker, Mr. S. Bennett, Mr. Catherall, Colonel Challoner, Mr. Cobon, Mr. Dyer, Mr. Flack, Mr. Fuller, M.P., Mr. Gales, Mr. Hamond, Mr. Fisher Hobbs, Mr. Hudson (Castleacre), Mr. Jonas, Mr. Kinder, Mr. Milward, Mr. Paine, Mr. Pawlett, Prof. Sewell, Prof. Simonds, Mr. R. Smith, Mr. Stokes, Mr. Thompson, Mr. C. Hampden Turner, Prof. Way, Mr. Jonas Webb, Mr. Wingate, and Mr. Wrench.

The following communications were received:—From the Hon. Col. Gery, by command of H.R.H. Prince Albert, letters on the subject of sound untainted potato-seed, proposed for cultivation in Ireland; from Mr. Wright, of the United States, a communication on improvements in the reaping-machine, and a set of the "Prairie Farmer," of which he was the editor; from the Hon. Andrew Stevenson, late American Minister in England, a letter offering his services of co-operation as an honorary member of the Society, and specimens of wool and monumental wheat; from Mr. Palin, of Cheshire, a statement on the beneficial and long-continued effects of marling for the turnip-crop, with specimens of roots grown by him on marled and unmarled land; from Mr. Dyer and Mr. Whitear, results of the cultivation of Russian Turnips in this country; from Mr. Reynolds Solly, a favourable statement of the value of the Spanish Beans presented to the Council in the spring by Mr. Majendie; from Mr. Saunderson, specimens of Potatoes grown for three years without manure; from Mr. Morton, Mr. Waldron, and

Mr. Jackson, information respecting farm-buildings; from Mr. Arkwright, of Sutton Hall, Derbyshire, a very cheap, simple, and efficient grubber for raising large strong tufts of coarse plants having deep-seated roots; from Captain F. Wilson, a proposed new plan of barrow for general purposes; from Miss Banister, various communications connected with cottage farming; from Dr. A. Thær, a plan of the Moeglin Model Farm in Germany; from Mr. Brotherton, a communication on the importance of cultivating the Rape crop for its oil; from Mr. Metcalfe, on reaping machine; from Mr. Fowler, on Barley; from Mr. P. Dixon, balance-sheet of his farm; from Lord Berners, a further statement of his mode of draining in Leicestershire; from Mr. Witt, a specimen of paper made from Wheat-straw; from Mr. Clayton, a statement of improvements in his tile-machine; from Mr. R. Shaw, of Bristol, a communication on town-sewerage; from Mr. E. Oliver, various notices of agricultural facts; from Mr. J. Hill Dickson, a statement on his Flax-mill; from Mr. Hardy, on sowing, with specimens; from Mr. Lang, on manure; and from Mr. Fuller, M.P., on disease in his stock—for all which the Council ordered their usual acknowledgments to be made.

A SPECIAL COUNCIL was held on Thursday, the 9th of December, for the purpose of deciding on the prizes for live-stock to be offered next year at the Gloucester meeting; present, Mr. RAYMOND BARKER, Vice-President, in the chair; Lord Berners, Colonel Austen, Mr. Barnett, Mr. S. Bennett, Mr. Brandreth, Mr. Fisher Hobbs, Mr. Holland, Mr. Hudson (Castleacre), Mr. Jonas, Mr. Kinder, Mr. Milward, Mr. Pusey, Mr. R. Smith, Mr. Thompson, Mr. Turner (Barton), Mr. Jonas Webb, and Prof. Simonds.

The Council having received and considered various memorials and suggestions addressed to them, in reference to the special business of the day, proceeded to the arrangement of the prizes to be offered by the Society for live-stock at the Gloucester meeting in July, 1853; postponing, until the monthly Council to be held on the 2nd of February next, the final settlement of the prizes for poultry, the general regulations of the prize-sheet, and the special instructions to be given to the judges and stewards on that occasion.

THE AUDIT OF ACCOUNTS was held on Friday, the 10th of December; present, Colonel Austen, Mr. Raymond Barker, and Colonel Challoner, on the part of the finance committee; and Mr. George Raymond Barker and Mr. Dyer, auditors, on the part of the Society. The accounts being found correct, were certified accordingly, and the signatures of the auditors affixed to the balance-sheet to be reported on the following day to the general meeting of the Society.

A SPECIAL COUNCIL was also held on Friday, the 10th of December, for the purpose of taking into consideration the report to be made by the Council to the ensuing General Meeting of the Society; Colonel Challoner, trustee, in the chair. The Council having received from Mr. Raymond Barker, chairman of the Finance Committee, a special report on the state of the Finances of the Society at that date, and a copy of the Auditors' Balance-sheet of the accounts for the preceding half-year, proceeded to the arrangement of their report to the General Meeting; which on the motion of Mr. Bramston, M.P., seconded by Professor Sewell, was agreed to and adopted.

THE DECEMBER GENERAL MEETING was held at the Society's House, in Hanover-square, on Saturday,

the 11th of December; Col. Challoner, Trustee, in the chair.

The Meetings of the Council stand adjourned over Christmas, to Wednesday, the 2nd of February.

#### NEW MEMBERS.

Jonathan Rigg, Esq., of Chester-place, Hyde-park-square, London, was elected a Governor of the Society.

The following new members were elected:—

Addison, Richard, the Prior's Mesne, St. Briavell's, Glouce.

Budenham, Charles, Hereford

Brown, James, Arncliffe, Co. Edinburgh

Clark, William, Shareshill, Wolverhampton

Elwes, John Henry, Colesbourne House, Cheltenham

Glazier, William Richard, 41, Charing-cross, London

Goddard, Henry, Lincoln

Harding, George, Ternhill, Market Drayton, Salop

Haygarth, Rev. J. S., Pres. of Royal Agri. Coll., Cirencester

Hellier, Thomas Shaw, Woodhouses, Wolverhampton

Hew, John, Barnstaple, Devonshire

Huskinson, T., Epperstone, Southwell, Notts.

Hutchings, Rev. R. S., Monkton Wyld, Charmouth, Dorset.

Howard, James, Bedford

Jones, Mordcau, Brecon, South Wales

Morris, William, Dartmouth, Devonshire

Playford, Edward Harlee, East Wyke, Farnham, Surrey

Sparrow, John Wilham, Penn Hall, Wolverhampton

Vernon, Hon. Aug. Henry, Upper Belgrave-street, London

Yates, William, Hadley Park, Wellington, Salop.

### ROYAL DUBLIN SOCIETY'S EXHIBITION OF IRISH-GROWN FARM-PRODUCE AT THE LATE SMITHFIELD CLUB SHOW, LONDON.

NAME OF PRODUCE.	EXHIBITOR.	COUNTY.	Tons per Acre.	DESCRIPTION OF LAND.		MANURE PER ACRE.	
				Soil.	Subsoil.	Tons.	Description.
RED GLOBE MANGEL.	Earl Charlemont.....	Dublin.....	96	Light loam.....	Yellow clay.....	35	Farm-yard.
	Lord Malahide.....	Ditto.....	50	Deep sand loam...	Strong yellow clay	30	Do.
	Mrs. Evans.....	Ditto.....	68	Alluvial moor.....	Blue clay.....	50	Do.
	T. Ball.....	Ditto.....	60	Limestone.....	Gravel.....	40	Do. (1)
	Alex. Tate.....	Ditto.....	70	Light rich loam...	".....	30	Do.
	W. Dargan.....	Westmeath..	40	Loam.....	Gravel.....	40	Do. (2)
LONG RED MANGEL.	Lord Malahide.....	Dublin.....	50	Strong gravel.....	Grey gravel.....	40	Do.
	R. Hawkins.....	Wexford.....	90	Brown loam.....	Yellow.....	50	Do.
	Mrs. Evans.....	Dublin.....	68	Alluvial.....	Blue clay.....	50	Do.
	R. J. Staveley.....	Ditto.....	40	Loam.....	Light clay.....	30	Do.
	P. M. Gresham.....	Ditto.....	70	Deep loam.....	Gravel.....	40	Do.
	Alex. Tate.....	Ditto.....	70	Light rich loam...	".....	30	Do.
	Hon. F. Shaw.....	Ditto.....	50	Clay.....	Strong.....	100	Do.
Jas. Perry.....	Ditto.....	60	Clay.....	Strong gravel...	None.	After potatoes.	
YELLOW GLOB. MANGEL.	Hon. F. Shaw.....	Ditto.....	50	Clay sand.....	Strong.....	100	Farm-yard.
	Mrs. Evans.....	Ditto.....	65	Alluvial moor...	Blue clay.....	50	Do.
	Earl Charlemont.....	Ditto.....	90	Light rich loam...	Yellow clay.....	35	Do.
	Col. H. Hall.....	Ditto.....	35	Strong bk. clay...	Yellow clay...	35	Do. (3)
	Sir R. Shaw.....	Ditto.....	40	Sandy loam.....	Gravel.....	30	Do.
	R. J. Staveley.....	Ditto.....	35	Loam.....	Gravel.....	25	Do.
C. Doyne.....	Ditto.....	44	Strong corn.....	Strong clay.....	50	Do. (4)	
YELLOW GLOB. MANGEL.	Alex. Tate.....	Ditto.....	70	Light rich loam...	Strong clay.....	30	Do.
	R. Hawkins.....	Wexford.....	80	Brown loam.....	Yellow clay.....	45	Do.
SUGAR BEET.	Alex. Tate.....	Dublin.....	50	Light rich loam...	Yellow clay...	30	Do.
	Mrs. Evans.....	Ditto.....	30	Alluvial moor...	Blue clay.....	50	Do.
	R. Hawkins.....	Wexford.....	60	Strong clay.....	Brick clay.....	50	Do.
SWEDISH TURNIPS.	Earl Charlemont.....	Dublin.....	70	Light loam.....	Yellow clay.....	30	Do.
	The Lord Chancellor.....	Ditto.....	70	Yellow clay.....	Light gravel...	35	Do.
	Mrs. Evans.....	Ditto.....	60	Strong loam.....	Yellow clay.....	50	Do.
	Wm. Dargan.....	Cork.....	45	Dark earth.....	Clay.....	40	Do. (5)
	Ditto.....	Westmeath..	40	Loam and gravel..	Limestone.....	25	Do. (6)
KOHL RAB. {	Alex. Tate.....	Dublin.....	40	Light rich loam...	Limestone.....	30	Do.
	R. Hawkins.....	Wexford.....	40	Heavy clay.....	Brick clay.....	45	Do.
PARSNIPS.....	C. Putland.....	Wicklow.....	25	Clay.....	Clay.....	35	Do. (7)
CARROTS...	Mrs. Evans.....	Dublin.....	35	Alluvial moor...	Blue clay.....	None.	After mangel.
	R. Hawkins.....	Wexford.....	40	Brown loam.....	Yellow clay.....	50	Farm-yard.
	R. P. O'Reiley.....	Longford.....	42	Shallow rushy...	Stiff.....	46	Do.
	F. Donagh.....	Meath.....	30	".....	".....	None.	After barley.

(1) Mixed with 3 cwt. guano; (2) With 3 cwt. bones; (3) With 3 cwt. guano; (4) With 6 cwt. salt; (5) With 7 bushels vitriolized bones; (6) With 3 cwt. of vitriolized bones; (7) With bone-dust.

One of the most important, if not the most important stand at the exhibition at the Smithfield Show this year, if we except the Messrs. Gibbs', the eminent seedsmen of the Royal Agricultural Society of England,

was the collection of Irish-grown farm-produce by the Royal Dublin Society, through the Earl of Eglinton, Lord-Lieutenant of Ireland, President of that Society. The samples of produce are highly creditable to the



sister country, and tend, more than anything which could be written, to demonstrate the vast capabilities of the soil of Ireland for the production, not only of cereal, but green crops. The Royal Dublin Society is now established by charter more than a century: its object and aim is the promotion of husbandry and other useful arts, and over one thousand members are now connected with it in the advancement of husbandry and every other branch of industry that can promote the welfare and well-being of the inhabitants of that portion of this kingdom. To the kindness and courtesy of the curator of the society, Mr. Corrigan, who attended the stand daily, and afforded the numerous visitors the most minute information, we are indebted for the following particulars of some of the crops exhibited. A specimen of mangel wurzel from the National Model Farm at Glandore, the most southern point of Ireland, raised on a reclaimed bog, manured with sea weed, was very fine; the produce was 80 tons the Irish, or 50 tons the statute acre.

The preceding table of the crops exhibited will be interesting; but the reader must bear in mind that the Irish acre is larger than the English acre in the proportion of 8 to 5; so that, in the produce given, as well as the manure applied, to the Irish acre, may easily be calculated, and show what the proportion would be to the English acre.

The rent of an Irish acre at 10s. will be at the rate of 6s. 2d. the English acre; at £1 15s. the Irish it will be £1 1s. 7d. the English.

There were also some splendid cabbages, one sample of which got the prize at the late exhibition of the Royal Dublin Society, and was grown on strong clay land; the property of R. C. Wade of the County Meath, the produce was 80 tons the acre: it was the drumhead description. The specimen of field cabbage sent by F. Donagh, Esq., of Drogheda, was very fine, the produce 75 tons the acre: and a flat Dutch cabbage grown by R. Hawkins on the workhouse farm, Ennisceorthy, was part of the produce, at the rate of 60 tons the acre. The swedes contributed by

Sir Wm. Betham, Ulster King at Arms, Blackrock, near Dublin, were immense; some of them taken after a crop of potatoes and cabbages, being the third crop taken off the same field in one season. Nothing can more strikingly illustrate the wonderful fertility of the Irish soil, and must naturally attract the attention of persons wishing to embark their capital in the purchase of land, to the splendid climate and soil of Ireland. Mr. Dargan, whose name will be found as a producer in the above table, has also contributed a specimen of most excellent butter, made upon the best system adopted in this country, and pronounced by competent judges equal to the best Dutch. This gentleman deserves well of his countrymen for his unwearied exertions in their behalf: his farm operations are carried on under the most approved English system; he has lately commenced the manufacture of cheese on one of his farms, and that on a most extensive scale. This gentleman it is, also, who in a princely spirit advanced the money necessary to erect the building for the Great Industrial Exhibition which is to take place next year in Dublin; and who, as a large railway contractor, by his employment of the labouring poor contributes so much to the benefit of the working classes. Fifty such men as William Dargan in Ireland would do much for its restoration. We must not forget to mention that the Earl of Leitrim contributed a mammoth gourd, the weight of which was no less than 108lbs., and which was produced by common garden culture, and being the largest one of thirteen, all of great weight, produced from the same plant. We conclude this notice with the following remarks, in which we entirely concur, and which we extract from a coteremporary:—

"We can assure our friends in Ireland that it is by indulging in peaceful rivalry of this kind that her gaping wounds will be healed and her strength invigorated; that the boundless resources of her fertile soil will be developed, her hardy sons profitably and reproductively employed; her gentry made careful to their duties, and all joined in the noble career now opened before them of unlimited and unrestricted competition."

TABLE OF WEIGHTS OF PRIZE AND OTHER SUPERIOR SHEEP EXHIBITED AT THE SMITHFIELD CLUB CATTLE SHOW, DECEMBER, 1852.

Description.	No. of Animals	Numbered in the Catalogue.	Owner.	What Prize.	Purchaser.	Carcass.	Hides.	Fat.
						st. lb.	st. lb.	st. lb.
LONG-WOOLS.	3	161	Marquis of Exeter	2	Mr. Griffiths, Poland-st., Oxford-st	61 0		5 2
	3	165	Mr. Foljambe, Osberton Hall	3	Mr. Bassett, Crown-ct., St. James's	57 6		6 6
	3	171	Marquis of Exeter	1	Mr. Miller, Notting-hill	53 2		
	3	172	Mr. Turner, Barton		Mr. Bassett, Crown-ct., St. James's	52 4		7 0
	3	173	Mr. Foljambe, Osberton Hall		Ditto ditto	48 0		6 0
	3	182	Mr. Hester, Sevenhampton	P	Mr. Minton, Windsor	69 4		6 1
	1	197	Mr. Sanday, Nottingham	M.	Mr. Green, Kingsland-road	25 5	2 6	1 4
CROSS-BRED.	3	201	Mr. Druce, Eynsham	H. C.	Mr. Ching, Warren-st., Fitzroy-sq	65 4	9 6	7 1
	3	207	Mr. Overman, Burnham Sutton	2	Mr. Covell, Sydenham	65 3	7 4	6 4
	3	210	Mr. Davis, Sevenhampton	H. C.	Mr. Williams, Bermondsey-market	64 5		4 4
	3	218	Mr. Overman, Burnham Sutton	1	Mr. Randall, London-road	55 2		6 6
	3	219	Mr. Salter, Norwich	H. C.	Mr. Withers, Guldford	60 2		
1	229	Mr. Overman	H. C.	Mr. Mason, Queen-street, Chelsea	19 3		3 0	
SHORT-WOOLS.	3	244	Duke of Richmond	2	Mr. Anderton, Queen's-rd., Surrey	59 0		8 1
	3	245	Mr. Sainsbury, West Lavington	1	Mr. King, Paddington	55 5		
	3	253	Mr. Hayward, Folkington	C.	Mr. Deacon, Kilburn	41 0		5 2
	3	255	Lord Walsingham	2	Mr. King, Paddington	61 1		
	3	262	Duke of Richmond	P	Mr. Flicker, Fulham	58 0		
	3	266	Mr. Humfrey, Chaddleworth	P	Mr. Hatchiff, Hillington	52 1		9 0
	3	270	Mr. Portal, M.P.		Mr. King, Paddington	45 7		
	1	273	Lord Walsingham	H. C.	Mr. Hatchiffe, May-fair	15 4		
	1	237	Mr. Portal, M.P.		Mr. King, Paddington	17 0		
	1	290	Mr. Sainsbury, West Lavington		Ditto ditto	19 4		

TABLE OF WEIGHTS OF PRIZE AND OTHER SUPERIOR ANIMALS EXHIBITED AT THE SMITHFIELD CLUB CATTLE SHOW, DECEMBER, 1852.

DESCRIPTION.	OWNER.	Prize awarded.	PURCHASER.	WEIGHT.					
				CARCASS.		HIDE.		FAT.	
				st.	lb.	st.	lb.	st.	lb.
<b>DEVONS.</b>									
STEERS .....	Mr. Thomas, Walthamstow .....	1	Mr. Copeland, Windsor .....	113	4	8	4	13	1
	Earl of Leicester .....	2		Mr. Collingwood, Lamb's-Conduit-street .....	108	5			13
OXEN .....	Earl of Leicester .....	1	Mr. Collingwood .....	129	2			16	2
	Mr. Quartly, South Molton .....	2	Mr. Ratchife, May Fair .....	138	0			19	7
	Prince Albert .....	n. c.	Mr. Minton, Windsor .....	182	4	12	1	20	5
	Mr. Farthing, Bridgewater .....		Mr. Orris, De Bevoir-square .....	182	4				
	Mr. Gibbs, Bishop's Lydeard .....		Mr. King, Paddington-street .....	161	0			25	0
HEIFERS .....	Mr. Fournace, Durston .....	1	Mr. Story, Thames Ditton .....	129	2	10	3	20	0
	Mr. Farthing, Stowey Court .....	2	Mr. Cook, Clapham Road .....	134	0			21	0
COWS .....	Mr. Bond, Bishop's Lydeard .....	1	Mr. King, Paddington street .....	159	0			22	0
	Mr. Fournace, Durston .....	2	Mr. Harman, High Wycomb .....	143	3	8	6	13	1
<b>HEREFORDS.</b>									
STEERS .....	Prince Albert .....	1	Mr. Orris, De Bevoir-square .....	148	6				
	Mr. Cawardine .....	c.	Mr. Sheppard, Holloway .....	140	0			14	0
OXEN .....	Prince Albert .....		Mr. Turner, Sheffield .....	196	2			31	0
	Mr. Maydwell, Ashstead .....	1	Mr. Bannister, Threadneedle-street .....	181	4			21	6
	Mr. Phillips, Ardington .....	2	Mr. Stevens, Oxford .....	158	0	14	3	24	4
	Mr. Heath, Norwich .....		Mr. Slater, Kensington .....	157	6	12	4	20	4
	Mr. Druce, Eynsham .....		Mr. Stevens, Oxford .....	165	0				
HEIFER AND COW .....	Mr. Cook, Ludlow .....	1	Mr. Randal, London Road .....	162	3			20	6
	Mr. King, Nurseling .....	2	Mr. Watson, Weybridge .....	127	0	10	0	16	0
<b>SHORT-HORNS</b>									
	Lord Londes' Ox .....		Mr. Mason, Queen-street, Chelsea .....	196	0	14	0	24	4
HEIFERS .....	Mr. Tucker, Stratford .....	2	Mr. Justice, Crown-court, Pall-mal .....	174	6			16	0
	Mr. Newbatt, Sleaford .....	c.	Mr. Harris, Chertsey .....	177	0	11	3	25	6
	Lord Feversham .....	c.	Mr. Cragg, Mount-street .....	157	4	10	0	18	0
STEER AND COWS .....	Mr. Stratton, Pewsey .....	1	Mr. Smith, Salisbury .....	155	0	11	1	20	0
	Mr. Carrington, Great Missenden .....	c.	Mr. Jordan, Barnet .....	164	0	10	0	20	4
	Mr. Gooch, Honingham .....	c.	Mr. Randal, London Road .....	176	6			24	0
	Mr. Townley .....		Mr. Turner, Sheffield .....	77	2			35	4
SCOTCH, WELSH, OR IRISH.	Mr. Rob., jun, Thorpefields .....	c.	Mr. Chambers, Ealing .....	137	4	10	6	12	0
	Marquis of Exeter .....	c.	Mr. Speed, Chelsea, Queen's Rd. .....	146	0	10	0	23	4
	Mr. Rob. Cotton, near Thirsk .....	c.	Mr. Elphick, Great Mousley .....	112	0			18	2
	Mr. Heath, Norwich .....	c.	Mr. Stedwell, Twickenham .....	159	0			19	0
	Mr. Gurney, Norwich .....	c.	Mr. Collingwood, Lamb's-C.-street .....	194	3			21	2
	Mr. McCombie, Tillyfour .....	c.	Mr. Mann, Croydon .....	170	0	12	0	37	0
	Rev. Mr. Arkwright, Harlow .....	1	Mr. Jeffery, Regent-street .....	173	0			19	0
Mr. S. Jonas, Ickleton .....	c.	Mr. Sutton, Dalston .....	190	0	14	0	25	0	
	Duke of Beauford .....	c.	Mr. Slater, Kensington .....	159	6	13	0	25	3
HEIFER .....	Sir John Cathcart, Chertsey .....	p.	Mr. Bannister, Windsor .....	102	4*	8	2	19	0

\* The Baron of Beef for her Majesty's table was from this animal: its weight was 446 lbs.

It is with great regret that we have to record the death of CHAS. CHARNOCK, Esq., of Holmeild House, near Ferrybridge, on the 11th Dec., in the 52nd year of his age. As a successful agriculturist of the modern school, Mr. Charnock ranked amongst the foremost of those who, by the application of science with practice, have left an example of profitable cultivation that deserves to be more generally followed. For upwards of twenty years Mr. C. occupied the Holmeild House Farm under Mr. Milnes, in which period the average production of crops was quintupled, and the live stock increased in a still greater proportion. Mr. Charnock's scientific attainments were considerable; and as a meteorologist and microscopist he was surpassed by very few. As a chemist his knowledge enabled him to apply successfully many of its known results in cultivation; and as an illustration of this may be mentioned his use of salt for some years past, the anticipated effects from which he based on those chemical deduc-

tions which the recent experiments of Professor Way on the absorbent properties of soils have shown to be well founded. The agricultural community are also indebted to him for other valuable suggestions which are being progressively adopted. Mr. Charnock was one of the vice-presidents of the London Meteorological Society, and a member of the British Meteorological Society. He for many years recorded and furnished to the registrar-general the quarterly district meteorological returns, a gratuitous contribution to science, which involved both time and money, and constant attention and care. Some two years before his death he declined this duty in disgust, on finding that the only request he ever preferred, and that not on his own behalf, at high quarters, although backed by the registrar-general, was disregarded. His loss will be deeply deplored by a large circle of friends, as well as by his neighbourhood generally, where he was deservedly esteemed and respected.

METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.			WIND AND STATE.		ATMOSPHERE.			WEAT'R.
Day.	8 a.m. in. ets.	10 p.m. in. ets.	Min.	Max.	10 p.m.	Direction.	Force.	8 a.m.	2 p.m.	10 p.m.	
Nov. 23	29.51	29.05	32½	43	42	S. E., var.	strong	cloudy	cloudy	cloudy	dry
24	29.24	29.84	41	43	39	Northerly	calm	cloudy	cloudy	fine	dry
25	29.96	29.80	32	44	44	S. S. W.	gentle	fine	sun	cloudy	rain
26	29.53	29.52	42	54	47	South	strong	cloudy	cloudy	cloudy	rain
27	29.70	29.85	40	47	39	W. by South	lively	fine	sun	fine	dry
28	29.70	29.50	38	47	38	W. S. W.	strong	cloudy	cloudy	cloudy	rain
29	29.50	29.63	32	37	36	Northerly	gentle	cloudy	cloudy	cloudy	dry
Dec. 30	29.80	29.93	33	42	37	N. Westerly	gentle	cloudy	cloudy	cloudy	dry
1	29.92	29.88	29	47	44	S. West	gentle	fine	cloudy	cloudy	rain
2	29.84	29.91	41	47	42	S. W., W. S. W.	gentle	cloudy	sun	cloudy	dry
3	30.04	30.04	37	44	54	S. West	calm	fine	sun	cloudy	dry
4	29.91	29.92	44	54	51	S. S. W.	strong	cloudy	cloudy	cloudy	rain
5	29.95	29.95	50	55	52	S. West	lively	cloudy	cloudy	cloudy	rain
6	29.80	29.80	47	52	44	W. by South	lively	cloudy	cloudy	cloudy	rain
7	29.72	29.55	44	48	44	S. by West	gentle	cloudy	cloudy	cloudy	rain
8	29.35	29.30	42	49	44	S. by S. W.	rising	cloudy	cloudy	fine	rain
9	29.50	29.60	38	50	49	W. by South	gentle	fine	fine	fine	rain
10	29.61	29.61	48	54	50	S. Westerly	gentle	cloudy	cloudy	cloudy	rain
11	29.64	29.66	49	53	47	S. Westerly	lively	cloudy	cloudy	cloudy	dry
12	29.59	29.50	47	53	50	South	hd. var.	cloudy	cloudy	cloudy	rain
13	29.58	29.45	46	53	50	Southerly	lively	cloudy	fine	fine	rain
14	29.45	29.37	47	53	45	S. West	lively	cloudy	fine	fine	rain
15	29.40	29.16	45	51	44	S. West	lively	cloudy	cloudy	fine	rain
16	29.33	29.20	40	49	49	S. Westerly	rising	fine	cloudy	cloudy	rain
17	29.15	29.26	44	48	48	S. West	lively	cloudy	cloudy	cloudy	rain
18	30.01	30.30	34	42	40	N. by W.	gentle	fine	sun	cloudy	dry
19	30.19	30.05	40	52	45	S. or by W.	lively	cloudy	cloudy	cloudy	rain
20	29.88	30.00	44	53	46	S. Westerly	v. brsk	cloudy	fine	fine	dry
21	30.05	29.98	42	48	38	W. by North	gentle	fine	sun	fine	dry
22	29.83	29.78	38	48	44	S. W., W.	gentle	cloudy	fine	cloudy	drizzle

ESTIMATED AVERAGES OF DECEMBER.

Barometer.		Thermometer.		
High.	Low.	High.	Low.	Mean
30.32	29.12	55	17	39.2

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
48.86	40.86	44.86

WEATHER AND PHENOMENA.

Nov. 23.—Hoar frost; wind rises in evening, and rain follows. 24.—Smoky clouds; lunar halo. 25.—Rime; followed by clouds and rain at 9 p.m. 26.—After stormy night, rain for hours. 27.—Fine and sunny; rich glowing sunset. 28.—Change to wet; cirrus and other modifications. 29.—Gentle frost early in the day, and overcast. 30.—Overcast.

LUNATION.—Full moon on the 26th, 6 h. 41m. afternoon.

Dec. 1.—Early frost; drizzly night. 2.—No rain, and some gleams. 3.—Evening doubtful. 4.—Rain at night. 5.—Shower, then drizzle. 6, 7, 8.—Much rain. 9.—Pretty fine, with little sun; rain for an hour, 3 to 4 p.m. 10.—Much rain in the past night. 11.—Pretty fine; wind all night. 12.—Fine but watery sunrise; rainy evening. 13.—Much rain. 14.—Gleams; rainy evening. 15.—

Rainy night and showery forenoon. 16.—Fine; sunny forenoon. 17.—Thunder and showers in the past night; fierce wind. 18.—Cool and pretty fine; evening changeable. 19.—A trifling, small rain. 20.—Much finer. 21.—Improved; wind and white rapid clouds later. At 3h 12m. p.m. of this day the sun passes the tropic, and enters Capricornus. This should be noticed as an index of a possible change. 22.—Drizzle; somewhat improving at 2 p.m.

LUNATIONS.—Last quarter, 4th day, 22 m. after noon. New moon, 11th day, 3h. 32m. morning. First quarter, 18th day, 8h. 39m. morning.

REMARKS CONNECTED WITH AGRICULTURE.—A mere cast of the eye over the diary must satisfy every farmer that work remains at a stand-still; and what the prospect must be it is unsafe to hazard a conjecture. Large breadths of mangold have been secured, and are yet carrying to the stores. Stock of every kind appears to be healthy and abundant, but water abounds; in proof of which, the hidden river Bourn, perfectly invisible for eight or nine years, has lately risen, and still rises above ground, and forms a stream! Altogether, the entire year has presented a series of mutations and opposing phenomena.

Croydon, Dec. 22nd.

J. TOWERS.

## CALENDAR OF HORTICULTURE.

## PLANT HOUSES.

*Pelargoniums*.—The air for the last two months has been so abundantly charged with moisture, and generally so dull and stagnant as to render the keeping of these plants in a perfectly healthy state a very difficult matter. Still much may have been done by paying attention to previous directions, such as keeping the plants tied out thin, giving all the air possible, and withholding water to the roots, even to the flagging point. These directions must still be followed out in this the most critical period of their management. Keep them as near the glass as possible, but avoid letting cold draughts of wind play directly on them. The above directions, however, are principally applicable to plants thoroughly dormant, and required for the main and late flowering purposes next year. Such as are required for forcing, and also large specimens, should be in a partially excitable state, and will require more water, and a closer and warmer atmosphere. Those for forcing may be top-dressed and favoured with good situations near the light, and they will soon begin to show the trusses for bloom. Observe that these must not be shifted, as that would only cause renewed attempts at wood growth, and spoil the early blooming. On the contrary, plants required to make large specimens may, for the same reasons, be shifted into larger pots, using a tolerably rich compost, in a rough state, with plenty of sand intermixed, and paying the most particular attention to the drainage, because they must have more water; and if this does not pass off freely, you may expect a good portion of the old foliage to decay and fall off, besides creating too moist an atmosphere, resulting in drip, and causing even the newly-formed foliage to spot. The fancy varieties are the most tender, and should not be exposed to very free circulations of air. Unless under very favourable circumstances, they will all require a little fire occasionally, in the day-time, to dry up damp; and a slight fumigation sometimes, to check the great enemy, green fly. The fancy varieties are such free flowerers as to be peculiarly well adapted for forcing; and such as are required for that purpose may have the incipient trusses retained; the rest, for later purposes, should have them frequently picked out, to strengthen the growth of the wood and foliage.

*Conservatory*.—The Camellias in this structure, particularly large permanent plants, will now be fast advancing into an abundant bloom, and for some time to come will be one of its grandest features. See that the plants are kept perfectly clean, and the roots well supplied with water, to which a little liquid manure should sometimes be added. Oranges, too, with their bright, cheerful-looking fruit, are very beautiful now. They require but little attention at this season. Watering at the roots, unless under very particular circumstances as to dryness, caused by the use of fire-heat in severe wea-

ther, must be entirely withheld for a month or two. Syringing must also be discontinued: care, however, must be had to keep the foliage quite clean and glossy. Lachenalias throwing up flower-stems should be kept near the glass. *Gardoquia Hookerii*, a very nice autumn-blooming plant for the Conservatory, may now be removed to the stove, and kept growing freely. Give a shift when started, and keep them well stopped and tied out as they advance. The present is a good time to shift the different varieties of *Kalosanthes*; for, if left until the spring, it is likely to produce a fine growth, and but little bloom. Should frosty weather come on, take care that you have a good portion of your soils and composts turned over, and thrown up rough, or otherwise exposed to its very beneficial influences. See, too, that the bins under cover are kept full of soils in a state ready for use.

## FORCING HOUSES.

*Pineries*.—If previous directions have been attended to with regard to the regulation of the bottom heat and temperature, the principal crop intended for next year's fruiting will now be in a dormant state, and require very little attention. Let them have air more or less every day according to the state of the weather, and when very mild leave a little air on at night; the night temperature generally need not exceed 58°, and in sharp weather, when extra fire is put on, if the temperature is 55° early in the morning, it is safer than more. The day temperature should not exceed 65°; the younger successions will be safe with a degree or two less, taking care to maintain dryness both in the air and at the roots; for where there is much moisture a higher temperature must be maintained to keep out frost, the inevitable consequence of which is to induce a tendency to growth fatal to success. For Pines in a more advanced state previous directions are still applicable.

*Vineries*.—Early started Vines which are now beginning to make growth must have very careful attention. The night temperature should be raised gradually to 60°, with a tendency towards an increase as the Vines advance into bloom. The day temperature will much depend on external circumstances, but do not attempt more by fire heat than a range from 65° to 70°, with an abundance of air moisture, and a change of the interior air when practicable. Do not be in a hurry to disbud.

*Peach House*.—In this house, in accordance with former directions, let the excitement be very gradual; over-heating is the first step towards failure. I have known Peaches in bloom in severe frost submit with impunity to a temperature of 35°, and appeared to benefit by it; but as a general rule for Peaches in bloom, from 40° to 45° is a safe night temperature, and 50° to 55° in the day, taking care to secure a free admission of air as often as practicable. Keep up a healthy moist atmosphere, and when the bloom is not expanded syringe constantly with tepid water. If any portion of the roots are outside, see that they are amply protected. The same

remarks will apply to Cherries, which, however, will be far better if they have not been started, as the first week in the new year is very preferable for starting both Peaches and Cherries.

**Cucumbers.**—As soon as the bed is made up and the heat nicely rising, get in a first sowing; and beware of mice, which will often take possession at the same time as yourself. Keep the lights tilted, to let off the superabundant moisture; and let the coverings be regulated by the weather and the interior temperature. You will find it a good plan to thatch the bed all round with long dry hay, which can be fastened on with pegs and rope yarn, or even bay bands.

#### FLOWER GARDEN.

One of the best preventives of the unsightly appearance of worm casts on lawns is constant rolling with a heavy iron roller immediately after rain, as it plugs up

all their holes in a most effectual manner, and no doubt induces a new set of excavating operations before the holes are again open for traffic; it also consolidates the ground, and renders it much pleasanter for walking on. The same may be observed of gravel walks, on which, as well as the grass, the broom and the roller must be constantly plied in open weather. When frosty lose no time in wheeling out the composts, which should now be in a free pulverized state for adding to the beds and borders; some of the cleanest and best may be spread all over the borders containing herbaceous plants, which will help to protect them from inclement weather. Continue to trench up all vacant beds; and, as the leaves are now all down, commence forking over the outside shrubby borders, in order to bury the leaves which always accumulate in such places, and take the opportunity to prune and regulate all shrubs requiring it as the operation of digging proceeds.—C.

## AGRICULTURAL REPORTS.

### GENERAL AGRICULTURAL REPORT FOR DECEMBER.

An unusually moist and damp atmosphere, accompanied with southerly winds, has been the leading characteristic of the weather since we last wrote; indeed, as was the case in the two preceding months, there have not been three consecutive days which may be called fine. As a matter of course, agriculture in general has been kept in a state of abeyance, and little or no progress has been made in the fields. Up to the present time, not more than one-third of the winter wheats have been sown, whilst the plants above ground are looking sickly and otherwise unhealthy. The backward state of ploughing and sowing is wholly the result of the long-prevailing wet, which has so saturated the soil as to render it impossible for the plough to pass over it. In many parts of the country serious damage has been sustained by the extensive floods, and in many cases stock has been carried away and lost. We need scarcely observe that some time must of necessity elapse ere the land can become sufficiently dry to be worked with advantage; hence unfavourable consequences are anticipated from the present backward state of things. At the time we are writing there is every appearance of large additional falls of rain. Should they continue much longer, and should a sharp frost follow, all further progress in the field, should it be attempted, will be immediately stopped.

The quantity of new wheat as yet thrashed out having been very moderate, the corn trade has assumed a firmer tone, and prices have steadily advanced. Flour has improved in value to some extent, but the quotations of all spring corn have not materially changed. The imports from abroad

have shown a material falling off; but it is pretty evident that, owing to the rise in the markets on this side, they will increase to some extent in the spring months.

The demand for both fat and store stock has ruled somewhat active, and very large transactions have taken place at improved quotations. That fat stock is now tolerably remunerative, none can deny; but we perceive that oilcake is getting more and more in use in all the leading districts; hence its value has further improved, with every prospect of higher currencies. Our correspondents state that sheep are now less abundant than have been recollected for several years past; and further, that very high prices may be looked for during the next two or three months. Certainly, the prospect is more in favour of an advance than a fall in them.

The supplies of hay are very abundant, and cheap. In London, meadow hay has sold at from £2 15s. to £4 2s.; clover do., £3 15s. to £5; and straw, £1 4s. to £1 13s. per load. The carrot and turnip crops have turned out remarkably fine, and of good quality. In all quarters they are selling at very moderate prices. This is a great boon to the graziers, who are not likely to stand in want of stock food during the whole of the winter, even though they have not had the usual opportunities of taking advantage of the pastures, unless indeed in high situations.

At this time of the year the imports of guano are usually large; but this season they have been unusually small. The limited quantity of field work going forward has completely checked the demand, and prices have ruled almost nominal. Peruvian has been quoted at from £9 to £9 5s. per ton. The excitement on the subject of the guano

monopoly appears to have subsided, as we perceive that no efforts are being made to break down a system which entails heavy pecuniary losses to the British farmers. This is to be much regretted, because the present system deprives the soil of England of an invaluable manure.

We regret to state that the accounts from most quarters respecting the winter stock of potatoes are of a most unfavourable character. The excessive moisture has been productive of rot in the pits, and a portion of the supply has been thus rendered unfit for consumption. Large quantities have been forced for sale; but really sound parcels have realized good prices, viz., 130s. to 140s. per ton. From the continent the imports have been on a liberal scale, viz., about 3,500 tons, which have come to hand in fair average condition. The quantity of potatoes grown in France, this year, has increased to some extent. The arrivals of Irish stock into London direct by sea have almost wholly ceased. The fact appears to be that the shipments in the early part of the year entailed serious losses upon the owners. France has forwarded no supplies for a considerable period, and the same remark may be applied to Spain. It is clear, from the heavy expenses of shipment, and the low prices obtained for Spanish beasts in London, that further arrivals of moment cannot be anticipated. If we except the arrivals of sheep from Germany, Holland may now be considered as having the exclusive privilege of sending stock to England in any quantity.

The upward movement in the value of grain in London has had a corresponding influence upon the demand in the leading continental markets, to which large orders for the purchase of wheat and other articles for spring shipment have been forwarded by our merchants.

In Ireland and Scotland, a full average business has been transacted in grain and fat stock. Prices, almost generally, have advanced, with a good consumptive demand.

#### REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

The metropolitan, and nearly the whole of the leading provincial markets have been seasonably well supplied with fat stock, during the month just concluded; nevertheless, the trade generally speaking has ruled steady, and a very extensive business has been transacted at improved quotations.

The great day in Smithfield brought forward

large numbers of exceedingly well made-up beasts and sheep; indeed, the supply on that occasion, taken as a whole, was a remarkably fine one, in spite of the extremely unfavourable season for the rearing of stock in general. It may be remarked, however, that the supplies exhibited have fallen considerably short of those shown in the preceding month, when 23,063 beasts and 108,975 sheep were exhibited; yet we must bear in mind that their condition and weight were inferior, and that, consequently, fully a moiety of them were unfit for the leading butchers. Much surprise has been expressed at the fact that the arrivals of live meat in the metropolis do not keep pace with the increasing consumption. This point is easily explained. Many years since, the numbers of each kind of stock shown were fully equal to the present; but then we had not the extensive railway communication which we now enjoy, and of which advantage is taken by most of the graziers, jobbers, &c. The result is a great saving of food—because it is evident that stock brought by railway loses considerably less flesh than when it has to travel some 200 miles on foot—and a great increase in the slaughtering business in several parts of the country, especially in the neighbourhoods of the large hide and skin markets. The advance in the value of rough fat has tended to increase the price of both beasts and sheep, whilst the full currencies offered for raw hides have had considerable influence upon the minds of the buyers. Compared with last year, beef has sold at about stationary prices, but mutton has risen fully one penny per pound. This advance must be wholly attributed to the small number of sheep brought forward, and, we fear, to the decreasing supplies to be met with in most agricultural counties. The foreign imports have, to an extent, failed to have much influence upon the quotations; but the question arises whether or not the neglect of sheep breeding, from its being so very unprofitable some two or three years since, has not been principally caused by the free importation from abroad.

Notwithstanding the almost continuous rains during an unusually lengthened period, and that the pastures have been in a wretchedly damp condition, the stock has been well preserved in health. The long-complained-of disease has not made its re-appearance amongst the beasts; but we much fear that we shall shortly hear of numerous cases of rot amongst the sheep. The great abundance of the turnip and carrot crop has been productive of great advantage; but we understand that large quantities of hay and oil-cake have been consumed during the whole of the month.

The following are the total supplies shown in Smithfield:—

		Head
Beasts .....		21,018
Cows .....		540
Sheep .....		86,580
Calves .....		1,895
Pigs .....		2,259

COMPARISON OF SUPPLIES.

	Dec.	Dec.	Dec.	Dec.
	1848.	1849.	1850.	1851.
Beasts . . .	19,016	23,853	24,239	20,554
Cows . . .	490	442	316	451
Sheep . . .	87,240	119,180	99,944	93,462
Calves . .	1,113	1,413	1,864	1,201
Pigs . . .	1,549	2,139	2,619	2,872

Thus it will be perceived that the aggregate supplies shown in the metropolis have been small compared with some former years, but we think that the quantity of food has not fallen off.

The average prices have ruled thus :—

Per slbs. to sink the offals.

		s.	d.	s.	d.
Beef . . . . .	from	2	2	to	4
Mutton . . . . .		2	10	to	5
Veal . . . . .		2	8	to	4
Pork . . . . .		2	8	to	4

	Dec. 1849.	Dec. 1850.	Dec. 1851.
	s. d.	s. d.	s. d.
Beef	3 4 to 4 6	2 8 to 4 0	2 10 to 4 2
Mutton	3 6 to 4 6	2 6 to 4 2	2 10 to 4 4
Veal . .	3 2 to 4 0	2 6 to 3 6	3 0 to 4 4
Pork . .	3 4 to 4 2	2 8 to 4 0	2 8 to 4 0

Up to Newgate and Leadenhall, the arrivals of each kind of country-killed meat have been immense, especially from the west of England and the midland counties; nevertheless, the quotations have ruled firm, with an active demand. Beef has sold at from 2s. 2d. to 3s. 8d.; mutton 2s. to 4s. 6d.; veal, 2s. 6d. to 4s. 2d.; pork, 2s. 6d. to 4s. per slbs., by the carcass.

As is invariably the case at this period of the year, the imports of foreign stock have materially fallen off, and we have observed no improvement in their condition. The total supplies received into

London have been :—	Head
Beasts .....	1,397
Sheep .....	14,609
Calves .....	1,818
Pigs .....	46

Total . . . . . 17,870

Same month in 1851 . . . . .	21,594
Same month in 1850 . . . . .	20,435
Same month in 1849 . . . . .	16,368
Same month in 1848 . . . . .	12,346
Same month in 1847 . . . . .	11,028

Letters from Holland state that both beasts and sheep continue in great abundance, and that very large numbers are being "forced" for shipment in the spring months. As the navigation will now shortly close we may anticipate decreased arrivals.

SUBSTITUTE FOR GUANO.

From the great interest excited at the present moment by the discussion on this question, and the fact that the Royal Agricultural Society of England has offered a reward of £1000 and their Gold Medal for the discovery of a manure equal in fertilizing property to guano, and at a less cost, we are induced to call the attention of our readers to the prospectus of the Chemical Manure Company, which will be found in our advertising sheet. The interest excited is not confined to those engaged in agriculture; many classes of the mercantile world feel that the subject is one of the deepest importance, not only to the landed interest, but also to every department of British industry. The *London Mercantile Journal* has the following observations on the formation of this company :—

"Anything calculated to be of advantage to that large and important body interested in the cultivation of the soil, must, to a greater or less degree, have an influence on monetary affairs, and consequently on banking. If the cost of cultivating the soil can be reduced, and at the same time have the attendant advantage of producing larger crops, with greater certainty, notwithstanding the vicissi-

tudes of climate, one of the great sources of monetary disarrangements, owing to occasional, partial, or extensive failures in our cereal, leguminous, or bulbous crops, will be much alleviated.

"We, therefore, with no inconsiderable amount of satisfaction, point out to the notice of our readers the formation of a company having for its object the prevention of the sale of spurious manures, and at the same time the manufacture of a genuine fertilizing substance as a substitute for guano. It does not fall within our province, nor will it be expected from us by our readers, that we should enter into all the pro and con details as to the absolute feasibility of accomplishing what is promised in the prospectus of the Chemical Manure Company; manufacturing chemistry is of too recondate a character to render a disquisition thereon either agreeable or possibly intelligent to our readers. Of the 'bonâ fide' character of the undertaking we are, however, in possession of sufficient data in the character and high standing of the trustees, directors, bankers, and brokers, the list embracing names well known in agriculture, mercantile, and monetary circles.

"The superintending management is placed in the hands of a gentleman of well established reputation as a scientific and manufacturing chemist, who, we are informed, is so sanguine of the success which will attend the operations of the Company, that he has expressed his willingness to permit his pecuniary recompence to be dependent on the success of the undertaking, and not to participate in any profits until the shareholders have received a dividend of five per cent. on their paid-up capital. This is a feature which might be advantageously adopted in

most new schemes. It would be impossible to overrate the important results which may arise out of the successful issue of this undertaking, to which it is needless to say we wish every success. The capital proposed to be raised is apparently small for so vast an enterprize; but it has been deemed advisable to commence with the lowest practicable amount, and seek for powers from the legislature to increase the same from time to time, as it will gradually devolve itself."

## REVIEW OF THE CORN TRADE DURING THE MONTH OF DECEMBER.

Before what we are now about to write shall have met the eyes of our readers the year 1852 will have been numbered with the past. It has witnessed the rise and fall of the Derby Ministry—the ostensible friends of the agriculturists. We are inclined to think that the Government were disposed to endeavour to mitigate some of the evils which the total abolition of the duties on corn inflicted on the farmers of Great Britain, but public opinion decided against them; and it is now clear that nothing is to be expected from the Legislature. The only remedy which farmers have is to make the best bargain in their power with their landlords, and to use their utmost exertions to obtain such reforms as will tend to lessen the burdens pressing heavily on the land. The House of Commons having decided, by a majority of 415 to 53, that free trade is beneficial to the country at large, it would be vain to talk of a return to protective duties; it appears, therefore, to us, that it would be wise to give up the subject. But there may be means of lessening the cost of production; and it should be the work of farmers, and those who wish them well, to direct their attention to that point. We sincerely trust that our agricultural friends may yet be enabled to surmount the difficulties with which they are surrounded; and now that it has been definitely settled that free trade is to be the foundation of our commercial legislation, we can scarcely suppose that any party holding the reins of government can refuse to afford all the relief to the cultivators of the soil which the lightening of special burdens may be capable of affording. We do not deem it necessary to go further into this matter in this place, and shall now proceed with the more legitimate subject of our review.

At the close of the year, it may not be amiss to take a short retrospect of the fluctuations which have occurred in prices, and the changes which the trade has undergone during the twelve months.

At the opening of 1852 considerable confidence was felt, and it was then thought that the point of the greatest depression had been passed. This belief sufficed to give an impetus to business, and wheat advanced 4s. to 5s. per qr. at Mark Lane during January. The excitement was, however, of short duration, and in the following month nearly half of the rise was again lost. The weather during the time was favourable for outdoor operations, and farmers were in general busily occupied preparing the land for spring sowing. In March the tendency of prices continued downwards, and a further fall of 2s. per qr. took place. During April very little rain fell, and the temperature was low for the time of year; some uneasiness began, consequently, to be felt, more especially in regard to spring corn, pulse, and grass crops; and grinding barley, oats, &c., rather advanced in value. The wheat plant up to this period wore a healthy appearance, and the supplies from abroad being at the same time somewhat liberal, a further reduction of 1s. to 2s. per qr. took place in prices of the article in May. Before the close of that month the long-wished-for supply of moisture was afforded, and the temperature rising at the same time, vegetation received so great a stimulus that an early and plentiful harvest began to be reckoned on, in spite of the backwardness of the spring. The weather experienced in June tended to strengthen this favourable impression, and prices of wheat declined 2s. to 3s. per qr. at Mark-lane, whilst the value of other articles receded in proportion. Thus far everything had gone on prosperously; for though there were complaints respecting the potato crop, and the bean blossom was said to have set badly, the general aspect of the country was all that could be desired, and very sanguine expectations were entertained in reference to the future. The heat in July was intense, and early in the succeeding



month it began to be discovered that this had caused premature ripeness in wheat, many of the ears having died off before the grain was fully formed; this was, however, a minor evil compared to what followed: just as the crops had approached maturity and were ready for harvesting, rain set in: this continued throughout August and September, two dry days in succession being a rarity. A very small portion only of the wheat was secured before the fine weather broke up; a considerable quantity was carried in the worst possible condition, and those farmers who delayed carting until late in September did not gain much by so doing, as the corn by remaining in the fields exposed to drenching rain sprouted extensively in the ear. Harvest was not concluded in the southern parts of the kingdom until the beginning of October: in the north it was even later. We have on former occasions given our estimate of the general result of the harvest, and need therefore only remark here that the damage done to the quality of the new wheat was not overrated at that time: this has since been amply proved. Considering the extreme danger in which the crops were placed for several consecutive weeks, the months of October and November passed off very quietly. There was comparatively little excitement in the trade; and though prices of wheat underwent a rise of a few shillings per qr., even this advance was not maintained. The opening price for new wheat at Mark-lane was 32s. to 40s. for red, and 40s. to 50s. per qr. for white. These quotations afford a good idea of the great variety in the quality. For some months after the completion of harvest business remained very quiet: that the crop was short of an average and inferior in quality was generally admitted; but as foreign supplies continued to reach us regularly, no scarcity was at any time experienced. Matters went on in this way all through October and the greater part of November; it began, then, however, to be discovered that the continued and regular importations of foreign wheat and flour had caused no accumulation of stocks—in fact, that demand had kept pace with supply. The idea suggested itself, therefore, that the former might possibly during the winter months (when the arrivals from abroad generally fall off) overtake the latter, and merchants and millers who had until then conducted their operations with the utmost caution began to purchase somewhat more freely. Still no rise took place until towards the close of November. Since then the advance has been rapid; and it may be fairly estimated at 6s. per qr. The highest point was attained about the middle of December. Subsequently a slight re-action has occurred; and it may not be amiss during this calm to consider in how far this rise has been war-

ranted by circumstances, and what may be the probable course of prices hereafter. That the origin of the upward movement was perfectly legitimate we feel quite satisfied; but that the rise has since been considerably assisted by speculative purchases cannot be questioned. Such having been the case, it is not unlikely that a portion thereof may again be lost; but we are inclined to think, if this should occur, the decline would after a while be recovered. The inferiority of the quality of the last crop of wheat in all the southern parts of the kingdom, and the very great loss of potatoes, both on this side of the channel and in Ireland, must have caused an immense deficiency in the total produce of human food in the United Kingdom. This, we think, cannot be disputed; meanwhile low prices, and the generally prosperous state of the trade and commerce of the country, have caused an enormously increased consumption. The summer and autumn supplies from the Baltic, the Black Sea, and America have been absorbed before winter has well set in; and though the deliveries from our own growers have been tolerably good, stocks have not accumulated at any of the principal markets. We have now arrived at a period of the year when, in the ordinary course of affairs, the arrivals from abroad usually fall off, and though this may—owing to the extreme mildness of the weather thus far—not occur so early this season as in ordinary years; still the probability is that after the supplies which may yet be on passage shall have reached our shores, the receipts of foreign grain will be comparatively small till March or April next. An open winter would, of course, upset this calculation, but on this we cannot reckon with safety; and we are therefore disposed to believe that prices will rule higher the first three or four months in 1853 than they had done during any time since the commencement of free trade. The foregoing conclusion is not based in any way upon the weather which has been experienced during the last two months, though that ought not to be altogether overlooked.

The almost incessant rain in November and the first fortnight in December must have done more or less injury to the autumn-sown wheat; but this we do not consider the worst feature. The wet set in so early, that only a comparatively small breadth of land was finished at the time the fine weather broke up; and the seed which has since been committed to the ground cannot possibly have gone in in a satisfactory manner. There can be no doubt that the very unfavourable character of the autumn must have occasioned a much less breadth of land to be put under wheat than would have been the case if outdoor work had been practicable in November. The prospects for next harvest are, there-

fore, not such as to admit of a full average being calculated on, even if the seasons should hereafter prove propitious. We shall here close our speculations on the probable future. The last few years have proved most trying to the agriculturists of Great Britain: that the future may prove more prosperous, is our sincere wish; and with this hope for the new year we shall conclude this part of our subject, reserving the remainder of our space for our accustomed remarks on the changes which have taken place during the month at Mark-lane.

The arrivals of wheat coastwise into the port of London have been small, nor has the quantity brought forward by railway been by any means large.

The more remunerating rates which have lately prevailed have thus far failed to tempt farmers to bring forward more liberal supplies. This, no doubt, has been caused in a great measure by the extremely unfavourable state of the weather for thrashing; indeed, it has been almost impossible to get in the wheat from the rickyards, owing to the constant rain.

The small supplies brought forward having met with an active demand for shipment to the north, and the town millers having also been rather free buyers, the rise in prices has been quite as great in the London market as in other parts of the kingdom. During the first fortnight in December, the advance amounted to fully 5s. per qr., and 48s. was paid on the 13th inst. for moderately good, and 50s. per qr. for fine runs of red wheat. During the succeeding week the demand slackened, and these rates were scarcely obtainable on the 20th. The Christmas holidays having since intervened, business has been interrupted; still, there has been no actual giving way in quotations. The town millers have held off for the last week or two, in expectation of better supplies: whether they will succeed in buying cheaper remains to be seen: many have, we know, worked up their stocks rather closely; and should the demand for Yorkshire and the Channel ports again revive, which is not improbable, they might fail in effecting their object.

The transactions in foreign wheat were on a very extensive scale in the early part of the month; buyers visited our market from different parts of the kingdom, and considerable quantities of wheat were taken off the market for shipment coastwise. Subsequently, speculative investments to some extent were made, and the total rise in prices from the lowest point in November to the highest in December may be fairly reckoned at 6s. per qr. Within the last eight or ten days matters have assumed a quieter tone, the inclination to buy on speculation has in a great measure ceased, and

some of the parties who bought early have manifested a disposition to take their profits. The country demand having at the same time fallen off, and the local millers having acted with much caution, they have been enabled to secure what they have required for immediate use on rather easier terms than they could have done at the period when the excitement was at its height. Importers have, however, in general, displayed great firmness: many reckon so confidently on high prices hereafter, that they have withdrawn their samples.

Good red Baltic wheat in granary has not been offered below 50s.; and for fine parcels 52s. to 54s. per qr. has been asked. Other sorts have been held with equal firmness, and the best high-mixed Danzig could not be bought below 57s. to 58s.; indeed, picked qualities are held for 60s. per qr. The arrivals of wheat off the coast from the Black Sea having been small, the transactions in floating cargoes have been comparatively unimportant during the last week or two, but earlier in the month large purchases were made, partly on speculation and partly for Irish account, at very full terms. For Polish Odessa as much as 48s., for Ibraila 46s. to 47s., for Berdianski 50s., and for Egyptian 39s. to 39s. 6d. per qr., cost, freight, and insurance, having been paid. These terms continue to be asked for cargoes on passage, but the disposition to purchase has not been so active during the last fortnight as it was previously, and comparatively few bargains have consequently been closed. The offers from the Baltic have, in most cases, been at too high prices to tempt speculators. Early in the month a good many contracts were closed for Lower Baltic red wheat at 41s. to 43s. per qr., free on board in spring; but 46s. to 49s. having afterwards been asked, the demand has been checked during the last fortnight, and comparatively little has been done in this branch of the trade. The prices demanded for Danzig wheat, free on board in spring, have varied from 50s. to 54s. per qr., according to quality, and these are the rates still insisted on; it is, therefore, not surprising that purchasers should have been deterred from operating.

The great rise which has taken place in the value of wheat has obliged the town millers to put up the price of flour; early in the month they rose it 3s., and on the 13th inst. a further rise of 3s. per sack was established, making the quotation for the best marks 46s. per sack. The bakers got into stock rather largely before the advance, and have since bought with much caution: but sooner or later they will have to concede to the enhanced rates. Country flour has come to hand sparingly; indeed, owing to a too abundant supply of water, many of the mills have been unable to work. Norfolk households

sold currently at one time at 38s. per sack; since then, however, the price has given way about 1s. per sack. The arrivals of flour from America at this port have not been large, and considerable parcels having been taken on speculation, good brands, such as were worth 23s. to 24s. per bbl. at the close of November, have risen to 27s. and 28s., and the best Baltimore to 29s. per bbl. The demand has, however, within the last week, slackened, and a reduction of about 1s. per bbl. has taken place.

Until about the middle of the month, no increase took place in the supplies of English barley: the receipts of this grain have ever since harvest been on a moderate scale, and the article has commanded relatively higher prices than wheat. Within the last week or two we have, however, had better supplies; and the maltsters and distillers having bought less freely than before, the value of the article has suffered some decline. Really fine qualities have not been influenced so much as secondary descriptions, but even the former have been parted with at an abatement of 1s., and the fall on other kinds has been at least 2s. per qr. The supply of foreign barley, without having been large, has proved rather more than the demand has required, and the turn has been in favour of the buyer.

Malt was very difficult of disposal so long as a doubt existed as to the Derby Government being enabled to carry their measures; but since it has been settled that the duty is not to be reduced, prices have again stiffened, in spite of the dull state of the barley market.

The arrivals of oats were liberal up to the end of last month; since then the receipts have fallen off materially. From our own coast the quantity received has been quite trifling. Scotland has sent forward a fair supply, but the arrivals from Ireland have been much less than calculated on; and the receipts from abroad having also fallen short of expectation, factors have considered themselves warranted in demanding an advance. No rise could, however, be established until the 13th instant, and it did not then exceed 6d. to 1s. per qr. Several thousand quarters Archangel oats were taken at 20s. per qr. on that occasion, and this description of corn is now held at 20s. 6d. to 21s. per qr., making the total improvement since we last addressed our readers 1s. to 2s. per qr. Other qualities have not risen to quite that extent—indeed, on soft new Scotch it has been difficult to establish any advance. Opinion is strongly in favour of a rise in the value of this grain; in Ireland prices are relatively higher than in the English markets, and latterly quotations have got up faster in Scotland than with us. This we attribute to the increased consumption of oatmeal; and considering the high value of wheat and

Indian corn, the use of oatmeal may be expected to be much extended, both in Scotland and Ireland, potatoes being too dear to be largely consumed by the poorer classes.

Though English beans have come to market sparingly, and the arrivals from abroad have been moderate, this article has not excited much attention; prices have consequently remained very nearly stationary.

We may make the same remark in regard to peas, the consumption of which has been much lessened by the unusual mildness of the weather.

The transactions in floating cargoes of Indian corn have, during the month, been on an extensive scale, and prices have risen materially. The greater part of the cargoes which have arrived off the coast have been eagerly taken for Ireland, and there are now few parcels remaining undisposed of. For Ibraila as much as 34s. per qr., cost, freight, and insurance, has lately been asked; and fine Galatz has realized 35s. per qr. The use of this article in Ireland is very great, and the prevailing belief is, that notwithstanding the great rise already established, that prices will go still higher.

The establishment of the electric telegraph between London and most of the principal towns on the continent enables news from Mark Lane to be transmitted to the most distant Baltic ports in a few hours. A rise or fall in prices here is, therefore, almost immediately followed by a corresponding movement abroad; and the fluctuations we have recorded as having occurred in prices of wheat in the London market have been very quickly responded to on the other side.

Whilst prices were rising here, the greatest excitement prevailed there; but within the last week or two the Baltic advices have assumed a more subdued tone. The reaction has, however, not as yet been sufficiently great to bring down quotations to a level with our prices. At the Lower Baltic ports there are no sellers of good red wheat, 61 to 62lbs. per bushel, below 46s. to 47s. per qr. free on board in spring, and from Danzig the latest quotation for fine high mixed is 54s. to 56s. per qr.

The weather having been nearly as mild on the continent as with us, the principal rivers and harbours have remained free from ice, and shipments have continued to be made to a much later period than usual. The scarcity of vessels, and the very high freights demanded, proved a bar to extensive consignments to England; still some quantity has been despatched from time to time during the month, which, with what was shipped in November, will afford a good supply on the first shift of wind to the northward. Altogether we calculate there may be about 50,000 qrs. of wheat on passage from the Baltic for London. When this

supply shall have reached us, the receipts will, however, in all probability, be small for some time afterwards. At the near continental ports there are no stocks of consequence, which has prevented much being done for export to Great Britain. A few shipments have taken place from Hamburg to Hull, but the entire quantity has been trifling. At Amsterdam and Rotterdam high prices have been paid, and what may reach us from Holland must stand in, here, considerably more than it would at present bring. In France, quotations have all along been, and still continue, relatively higher than in the English markets.

Our advices from the Black Sea inform us that the scarcity of vessels had greatly curtailed the extent of the shipments, and it would seem therefore that the arrivals from thence will not be on so extensive a scale as was at one time expected. By the latest accounts from Odessa we learn that the total stock there consisted of about 500,000 qrs., of which quantity a considerable proportion would, it was stated, be required for local consumption, and for the supply of the Mediterranean markets.

On the other side of the Atlantic stocks appear also to have been greatly reduced by the summer and autumn shipments to Great Britain. At New York only about 350,000 brls. of flour remained in store, and as an early closing of the inland navigation was expected, it was thought that but little addition would be made to the quantity till the spring. Under these circumstances, the exciting reports from hence had produced great excitement, and prices had risen so rapidly as to render the execution of the orders received from England exceedingly difficult. The very high freights demanded (3s. to 3s. 6d. per brl.) for Liverpool had been a further obstacle in the way, and the shipments had therefore been less extensive than the encouragement held out by the state of other markets might be supposed to have induced.

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS.

WEEK ENDING:	Wheat.		Barley.		Oats.		Rye.		Beans.		Peas.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Nov. 13, 1852..	39	11	30	2	18	7	27	8	35	4	32	6
Nov. 20, 1852..	40	0	30	6	18	9	29	9	35	6	33	3
Nov. 27, 1852..	40	5	30	7	18	6	27	1	35	2	32	3
Dec. 4, 1852..	41	2	30	0	18	5	30	1	35	5	32	8
Dec. 11, 1852..	42	1	29	9	18	7	26	1	35	4	31	0
Dec. 18, 1852..	43	10	29	9	18	5	29	2	34	6	32	0
Aggregate average of last six weeks	41	3	30	1	18	6	28	7	35	2	32	5
Comparative avege. same time last year	37	2	26	10	18	4	26	2	29	10	29	1
DUTIES.....	1	0	1	0	1	0	1	0	1	0	1	0

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last Friday's Gazette.			Averages from the corresponding Gazette in 1851.			
Qrs.	s.	d.	Qrs.	s.	d.	
Wheat....	121,850	..	43	10	37	7
Barley....	116,239	..	29	9	26	6
Oats....	30,351	..	18	5	13	3
Rye.....	153	..	2	2	27	4
Beans....	6,151	..	34	6	29	9
Peas....	3,503	..	32	0	29	6

PRICES OF SEEDS.

BRITISH SEEDS.

Linseed (per qr.)..	sowing 54s. to 58s.; crushing 45s. to 50s.
Linseed Cakes (per ton)	£8 0s. to £9 10s.
Rapeseed (per last) new	£22 to £23, fine £24, old £21 to £24
Ditto Cake (per ton)	£4 10s. to £5 0s.
Cloverseed (per cwt.)	(nominal)
Mustard (per bush) new, white	7s. to 10s., brown 7s. to 9s.
Corian ter (per cwt.)	old 9s. to 12s.
Canary (per qr.)	45s. to 47s.
Tares, Winter, per bush,	4s. 6d. to 5s. Spring (nominal)
Carraway (per cwt.)	new 46s. to 47s.; fine 48s.
Turnip, white (per bush.)	Swede (nominal).
Trifoil (per cwt.)	26s. to 30s.

HOP MARKET.

BOROUGH, MONDAY, December 27.

The usual inactivity prevails in our market at this period, but the few transactions occurring are at unaltered rates.

Sussex Pockets	95s. to 150s.
Weald of Kents	86s. „ 100s.
Mid and East Kents	90s. „ 100s.

FREDERICK HORTON.

POTATO MARKET.

SOUTHWARK, WATERSIDE, Dec. 27.

Since our last report, the supply to this market has been moderate, and the same dull trade still continues. The following are this day's quotations:—

York Regents	per ton	80s. to 120s.
Lincolnshire ditto	.....	75s. „ 100s.
Scotch ditto	.....	80s. „ 95s.
Do. reds	.....	75s. „ 80s.
French whites	.....	80s. „ 95s.
Dutch	.....	60s. „ —s.

PRICES OF BUTTER, CHEESE, HAMS, &c.

Butter, per cwt.	s.	s.	Cheese, per cwt.	s.	s.
Friesland.....	96	98	Cheshire	50	70
Kiel.....	90	94	Cheddar.....	56	68
Dorset.....	96	100	Double Gloucester.	52	60
Carlot.....	86	90	Single do.....	41	50
Waterford.....	84	88	Hams, York.....	94	100
Cork.....	80	86	Westmoreland.....	74	80
Limerick.....	70	74	Irish.....	66	74
Sligo.....	78	82	Bacon, Wiltshire, green	54	58
Fresh, per doz.....	12	14	Waterford.....	50	52

CHICORY.

Foreign root (d.p.)	£	s.	£	s.	£	s.
Haringen.....	nominal		Roasted & ground			
English root (free)			English.....	28	0	0
Guernsey.....	nominal		Foreign.....	46	0	0
York.....	8	0	Guernsey.....	42	0	0
Duty on all Coffee and roasted Chicory imported,	3d.	per lb.;				
on Chicory Root	£21	per ton.				

HIDE AND SKIN MARKETS.

Market Hides, 56 to 64 lbs.	s.	d.	per lb.
Do. 64 72 lbs.	0	2	2 1/2
Do. 72 80 lbs.	0	2	2 1/2
Do. 80 88 lbs.	0	2	3
Do. 88 96 lbs.	0	3	3 1/2
Do. 96 104 lbs.	0	3	4
Horse Hides.....	5	6	0 each.
Calf Skins, light.....	1	0	2 0
Do. full.....	3	6	0
Polled Sheep.....	6	3	0
Kents.....	5	4	0
Half-breeds.....	5	4	0
Dovens.....	3	10	4 2

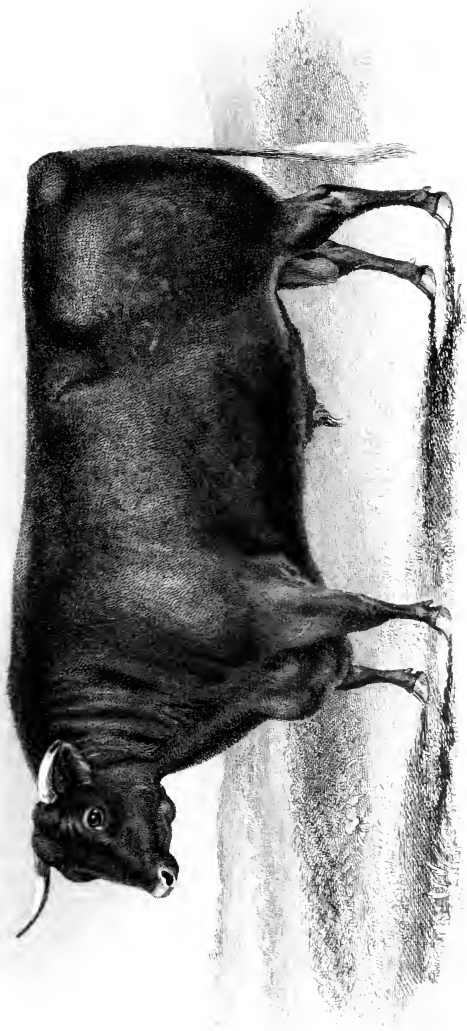
WOOL MARKETS.

LEEDS, Dec. 23.—The demand for combing and clothing wools still continues. Prices are without any change of moment.

LIVERPOOL, December 24.

SCOTCH.—There is still a good inquiry for Laid Highland wool at late rates, but stocks are in a small compass. White Highland is still very scarce. Laid Crossed and Cheviots are still in good request at full prices, with very light stocks.











# THE FARMER'S MAGAZINE.

FEBRUARY, 1853.

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## PLATE I.

### HEREFORD BULL.

The subject of our plate, the property of Mr. Samuel Farthing, of Stowey Court, near Leominster, is the winner of the following prizes: in 1850 he took the first prize at the Taunton show, and in the same year the first prize at the Bath and West of England show. In 1851 he was awarded the first prize in the second class at the Royal Agricultural Society's show, at Windsor; and in the same year he took the first prize as the best bull of any age, at the Taunton show, at the Bath and West of England show, and at the Bridgwater show. In 1852 he took the first prize at the Royal Agricultural Society's show at Lewes. The sire of this animal was bred by Mr. Farthing, and was also the winner of several prizes, and one at the Royal Agricultural Society's show. Mr. Farthing has four fine young bulls, got by the subject of this plate, which he expects will take all the prizes wherever he exhibits them this year.

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## PLATE II.

### COPENHAGEN,

#### THE FAVOURITE CHARGER OF HIS GRACE THE DUKE OF WELLINGTON.

Of all the great winners that we have from time to time given in our pages, none ever carried his rider home to victory with such general *éclat* as Copenhagen. Scarcely one, perhaps, who looks on his portrait but will be able to say what he did, and how he did it; still, though Copenhagen of all others may the least require them, we yet think it only right to offer the usual particulars as to pedigree and performance our readers may now be in the habit of looking for.

Copenhagen derives his name from the city in which he was foaled, his dam having been taken out there in the expedition of 1807, by the late General Grosvenor. Like most of our celebrated horses, he was not only thorough-bred, but very fashionably bred, being by Meteor (by Eclipse), out of Lady Catherine, by John Bull, dam by the Rutland Arabian. The turfits of those days will recollect the renown of the Meteor and John Bull blood, as well as the Olympic honours it brought to the Grosvenor family. The General, however, did not keep Copenhagen for any length of time, but sold him to the Marquis of Londonderry, then adjutant-general of the Peninsular Army, who sent him, with other horses, to Lisbon early in the year 1813. While here he was selected and bought, with another horse, by Colonel Charles Wood, at the price of four hundred guineas, for his Grace the Duke of Wellington, with whom he soon became, as he continued, an especial favourite. In the battles of Vimiera and Waterloo the Duke, we believe, used no other horse; and in the latter, it is said, was eighteen hours on his back; but Copenhagen gave little signs of being beaten, for on his rider patting him on the quarter as he dismounted after the battle, the game little horse struck out as playfully as if he had only had an hour's canter in the park. For endurance of fatigue, indeed, he was more than usually remarkable; and for the duty he had to fulfil as proportionately valuable. However hard the day, Copenhagen never refused his corn, though he eat it, like the Roman of old, at full length on his couch.

For many years Copenhagen was one of the most interesting of the "sights" at Strathfieldsaye, on which domain he was pensioned off, and where he at length died in illustrious old age. It was not, though, the stranger alone who asked for the famous old horse; the Duke himself rarely omitting to visit him, and the ladies of the family making him, as he deserved to be, an especial pet. And it would

have been extraordinary had they not; for, in addition to his well-earned renown, Copenhagen had one of the surest and best characteristics of true courage—an extremely good and docile temper. He was, in fact, one of those “noble creatures,” as the high-born dames delighted to call him, who liked being noticed, and who kissed hands and eat his apples with all the grace becoming the scene and the occasion.

Copenhagen, in colour a full rich chesnut, stood scarcely more than fifteen hands high; he possessed, however, very great muscular power, and, as will be seen from the engraving, had nearly all the good useful “points” to be looked for. His general appearance rather favoured the Arab cross in his pedigree, which his lasting qualities tended yet more to confirm. From his size he was not much adapted for crossing a country, though we believe the Duke did occasionally ride him with hounds. But in any field he must have sustained that repute for gameness with which the old-fashioned sportsman spoke of his favourite, and in a line that would not be out of place on the tomb of Copenhagen:—

“THE ONE GOOD HORSE WHO CARRIED HIM THROUGHOUT THE LONGEST DAY.”

## ON INCREASING THE SUPPLY OF MEAT.

BY JOHN DONALDSON,

Late Professor of Agriculture and Botany, at Hoddesdon, Herts, and Author of Prize Essay on the Cultivation and Management of Underwood, awarded by the Royal Agricultural Society of England.

The Conversion of all inferior Grass Lands into a state of Cultivation—The better Cultivation of Arable Lands—The more general Use of Green Crops—The Improvement of all Waste Lands—The Use of the best Breeds of Animals—The Increase of the Sources of Supply of the Lean Animals, to answer the demands of improved culture—Breeding Animals on the ground where they are fattened—Suckling of Calves, and good subsequent treatment—Allowing a good Maturity of the Animal—Improved Cultivation of every kind, both of the Soil and of the Animals.

In the kingdom of Great Britain, where the use of animal food enters so very largely into the list of articles of general consumption, the augmentation of the supply of that special commodity, in order to meet the demands of the rapidly increasing population, and also to extend the use of it among the lower orders of society, becomes a point of importance that is not exceeded in value of consideration by any national object in the whole circle of social and political economy. Food is the essential element of life; and being composed of different articles, the value of which stands in a relative position to each other, attention must be directed to the providing of them in the ratio which the index of the commercial interchange has established. Bread and beef are known to form the food of the strongest quality: labour is supported by these articles much longer than by vegetable productions, and the bodily vigour that is necessary to intellectual energy must be raised and upheld by the same means of primary articles. The value of these articles has been raised to the top of the highest scale of superior quality, and that value has placed them beyond the reach of the poorer population. Fluctuations occur of high and low prices, for which no cause can be seen, nor can any preventive be applied: all commercial uses are exposed to it, and the occurrence in the end is not deemed to be hurtful. But the special quantity must be steadily increased in proportion to the uni-

form rise in the population: demand necessarily calls for a supply, and incites the finding of the means of production. These means are advanced along with the other improvements that are effected in the cultivation of the soil, which is the source and support of all organized existence. As the quadruped part of the animated world is wholly dependent on the earth for its support, both in the quantity and quality of the food which sustains existence, primary attention must be directed to the cultivation of the land, in order that it may produce the greatest possible amount of necessary articles. The performance of this most essential requisite becomes a duty and an inquiry of the very last importance.

It is now admitted as an indisputable fact that green crops form the basis of improved agriculture, both for the production of corn and cattle. On whatever lands green crops can be got, other crops will invariably follow. Notwithstanding these most undeniable maxims in agriculture, a most unfortunate prejudice yet exists against the use of those crops, on the plea of requiring much labour and manure, and an undue degree of attention. A very strong predilection for grass lands is still entertained, arising from the latent barbarism of the mind, which adopts and adheres to the customs and practices which chance and accident have placed in use. Grass lands of the very best quality will yield a quantity of human food as large as if the land was under arable culture; but the case is wholly different on the inferior soils, which produce few grasses and mostly weeds. Where such soils are wet, close draining will wholly remove the evil, and adapt them for the green-crop cultivation. And for this purpose a most convenient accommodation is now afforded by the Government loans of money at 6½ per cent.

The conversion of all lands of this description from the present unproductive state into the alternate system of cropping and grazing, may be very justly placed as the first step towards augmenting the supply of corn and beef, which are always considered to be the staff of life. Inferior articles of food can only support animals of an inferior description, and also fewer in number, than when the land is used in the production of the best known articles of nutriment. Green crop plants are now known that can be raised on all soils except the very stiffest clays—an advantage which very much encourages the arable culture of every possible kind of lands. Without this well-known employment of the soil, the conversion of it to aration might be more justifiably refused. The retention of lands in grass, under such disadvantages, arises wholly from ignorance and prejudice.

The introduction of green crops forms the most valuable revolution that ever has happened in the art of agriculture, and one of the most extraordinary events that are recorded in the annals of the progress of human improvements. The practice of cultivation has been completely revolutionized: better animals have been produced, and the supply of every kind of food has been most amazingly increased. It is a fixed law in the alterations of animal organization that the more the points of it are refined, the quality of the food must be correspondingly raised, and consequently the arable culture of the land must advance with or rather precede the improvements in the animal kingdom. The foundation must be laid on which to build the superstructure, and the durability of it must be continued, to support the constantly increasing quantity of operations. Experience has shown that the dry food of hay and straw does not nourish and invigorate animals in any just comparison with roots: the juices are wanting, and the useful saliva that is engendered by the mastication of the esculent materials. The manure is also very inferior from culmiferous food, and becomes very much increased in value when mixed with the urine and juicy feces that come from the use of rooted vegetables. This property forms one of the chief recommendations for the use of esculents.

The fattening of animals never reached any degree of perfection till turnips and other roots were cultivated in a quantity to show its general advantages. The growth of the animal was slow, and the quality of the flesh was tough and meagre, and wholly wanting in the flavour and elasticity that are now procured. The number of the animals was also very deficient. The improvements that have been effected, and which are now permanently established in the organization of the animals of the farm, could not have been supported without a corresponding refine-

ment in the nutrition afforded to the organic functions: both quantity and quality become requisite to uphold and maintain an enlarged and improved carcass of living and inorganic parts of conjoined elements. Any material, either animate or inanimate, that is improved in the condition of its existence, and rendered finer in the nature of its essences, will sink and become deteriorated, unless it be supported and upheld by the association of elements that are correspondingly improved and elevated in quality. This necessity exists in every department of organic life.

The earth being the basis on which every human effort is exerted, the first attention must be directed to the condition of its capability of production, and to the means that are required for the development of its resources. The legitimate appropriation of its uses, according to the best modern knowledge of cultivation, is the most important inquiry, in order that the quantity may be increased both of animal and vegetable food. After the breaking up of the inferior grass lands that have been mentioned, the chief object of attention must be to fit them for the production of green crops, by draining where it is necessary, and by paring and burning where much foggage covers the surface. As has been before mentioned, wherever green crops are got other crops will follow, and consequently more cattle can be kept, and animals of a better quality.

Next to the conversion of the inferior grass lands into the arable state, the better cultivation of the lands that are and have been under tillage may be placed, as an infallible mode of increasing the supply of the necessaries of life. On a very large part of these lands sufficient capital and labour are not expended—injudicious cropping is practised, and over the breadth of the kingdom the returns of crops falls by more than “one-third” of the very easily available produce. Draining is mostly everywhere wanted, and the facility which is now offered in the loans of money by Government for that purpose is not generally accepted. Green crops are not used to the full extent, even in the fittest localities: prejudices remain to be overcome, after the experience of the inestimable benefits of more than three-fourths of a century. The produce of every kind is thus curtailed—the animals of use are lessened in number and reduced in quality, and the prices of value are unnecessarily enhanced. Every enlightened observer never fails to record the universal prevalence of hurtful prejudices, antiquated customs, and bigoted practice, which most effectually retard the progress of improvements, and limit the supply of food. In order to bring about the most desirable result of the most enlightened practice, the minds of the operators must be first enlightened by education, which will enable them to see the object in prospect, and then

to find the means necessary to effect the attainment. Liberality of mind is essential to the introduction of improvements, and it can only be obtained by the expansion of the intellectual faculties that arises from a varied and comprehensive learning. This enlightenment of the mind bears, in the first place, on the cultivation of the earth, and is next applied to the use of the better implements of every kind—dead, animal, and vegetable. The first improvement is required in the primary agents of operation: *it* must perform the first and most essential part, and provide for the gradual and regular progression of a connected chain of improvements. Without this fundamental requisite, no lasting benefit will be derived; the parts will not be duly apportioned, and the necessary mutual support will not be afforded.

The *radical* improvement must begin in the enlightenment of the minds of the cultivators, in order to introduce known practices of the greatest value, which will at least double the quantity of the produce of land of every kind, and the number of cattle among other articles. In order to rear animals to the useful maturity, green crops must form the foundation of the system of proceeding: by these crops the animals are quickly pushed into value, the manure that is made on the farm is greatly increased both in quantity and quality, and by that means, and by the working of the land for the growth of esculent roots, the production of the future culmiferous and leguminous crops amounts to an absolute certainty. The greater the number of cattle, the greater will be the produce of grain. The want of green crops limits the number of cattle, and the existing quantity is reared in an imperfect and profitless manner.

The next step to be taken in order to increase the supply of meat is the cultivation of "waste lands" of every kind, where physical obstacles are not wholly insurmountable. These obstacles are formed by the position of the ground, and the geographical aspect. But much land remains uncultivated which enjoys all the necessary properties for the useful cultivation: social obstructions and artificial regulations are allowed to interfere and to continue in existence, for the very hurtful purpose of impeding the production of food—by far the most important consideration that can be contemplated. Cultivation must be introduced on every spot of ground where the least approachable similarity exists, and where the produce will repay the labour, and afford some small encouragement for the outlay. There is certainly a daily progressing advancement in the way of improvement, both in new attempts and in the augmented repetition of the old modes of proceeding. But the journey is much too slowly performed, and the increase of the population creates demands that cannot bear so long a delay. The vast quantity of

labour that would be usefully and remuneratively employed would afford a livelihood to many thousands of families, and add very materially to the strength of society by the contentment which competence creates, and by the quietness which is shown when the necessaries of life are abundant. When individual inclination does not apply itself to the performance of such attempts, and where energy shrinks from the prospect of remuneration, it becomes a national concern that the earth be applied to the legitimate purpose of producing food for the population. Government having now recognised the principle in the Drainage Act accommodation, that objects of this nature demand legislative attention, an extension of the principle very naturally points to "waste lands" requiring the same application and the use of the soil as is given to wet lands to free them of superfluous moisture. And the employment of capital in that way would be more generally useful; for draining benefits wet lands only, whereas the former case extends to lands of every description.

When a complete intersection of the country by railway communication has been effected, the facility of transit will be most wonderful, and will afford the means of sending and fetching that cannot fail to exert a very powerful effect on the point we are now discussing. Many artificial manures are now known, and are or will be prepared in most towns in the kingdom, and can hence be carried to stations and depôts, for the use of the neighbouring lands. These fertilizers are best used in raising turnips; and where that invaluable root can be grown, other crops will follow, and very speedily introduce the rearing and fattening of animals. The same conveyance will carry every kind of produce to the markets in towns, and will bring in return everything that may be wanted. A very great recommendation consists in these manures being dry, light, and easily handled, and conveniently transportable. The possession of them offers a very great inducement to remote cultivation, where other conveniences are not available. The price is moderate, and the carriage is not a large sum, and the efficacy is now well established under all ordinary circumstances of application. The first crops being raised by these adventitious assistances, cattle will be introduced to consume them, manure will be produced, grain crops will follow, and a systematic production will be established. A steady increase will be thus promoted, both in animal and vegetable food.

It is sufficiently evident, without any need of demonstration, that the utmost possible cultivation of the earth must be first effected, as it constitutes the foundation of every improved state of animal and vegetable life, both in quantity and quality. The use of it supports every living thing, and therefore

the state in which it exists must form the primary consideration. Food of an inferior quality, or a pinched supply of the better kinds, will not rear and fatten animals in number, nor of the most improved organization: the growth is stunted, the maturity is deferred, and the carcass is deficient in every respect of quantity and quality. The very first existence of the animal is rendered nugatory by the feeding of the calf from the pail with the milk, instead of sucking, and by the substitution of the broths and juicy preparations for the nutriment of the dam. These insufficient materials spoil the animals at the very first outset: the intestinal offals are enlarged, the growth is stopped, and also the acquisition of the *stamina* of organic vigour, which forms the very first property in the value of animal life. Without constitutional vigour the organic functions are unable to perform their offices, and the food of the very best quality is not properly decomposed and assimilated. Every experience shows that no substances yet known will nurse a young calf so well as the mother's milk: the exposure of the milk dissipates the volatile juices, which are the most valuable parts, and the quantity of saliva is wanting which is engendered by the mouth sucking the teat, and which is so very useful in promoting the action of the stomach. Young animals that are fed by the two methods are very easily distinguished from each other: the one being large in the belly, unthrifty in the coat, and dull in the eye; the other being sprightly, sleek and shining in the coat, and the intestines confined in size. The suckling of the calf forms the foundation of the future animal. For the purpose of making butter and cheese, it only remains to allot a portion of the cows for that purpose, and the others for suckling; each purpose being kept separate and distinct, without the hurtful intermixture of starving the animal to procure the other products of milk. Each purpose must be so distinct as not to hurt the other.

All lands that are capable of being cultivated, having been put into a productive state of bearing the most esteemed crops, and the best known way of using these crops being adopted, it remains as an imperative consequence that the best breeds of animals be used in the respective localities; for after the utmost artificial improvements have been made, a peculiarity will always remain, which requires a special adaptation in the use of the productions. Fortunately, the special breeds of animals are well known at the present day, which are fitted to the different situations of soil and climate: they require only the legitimate adaptation in order to derive the full benefit, and by raising the necessary and essential aliment in quantity and quality. Without this provision, the introduction of improved animals will be wholly useless. It is owing to this neglected

point that so many failures occur in making the changes in the stock of animals. But in many very favourable situations, both of soil and climate, very inferior animals are yet kept, after a long experience of the superiority of other breeds. By this means both the quantity and quality of the animal food is lessened; for ill-shaped and slow-growing animals eat more food than a compact and refined organization, and converts it more slowly to a less beneficial purpose; a smaller quantity of flesh is carried on the bulk of bone, and the quality is inferior. And the most absurd custom yet prevails of starving the animals, in order that they may be reared at little cost. The latent barbarism of the mind adopts and continues the customs and practices which chance and accident have placed in use, and it rejects with contempt and dread the innovations that have been proved to be highly useful in exactly similar cases. A look into Smithfield Market shows the improved animals to form a small exception to the number of coarse, ill-shaped, and half-fatted carcasses that are weekly exhibited there: the best sorts are found in the hands of a few individuals only, who have seen advantages and have used the necessary means of securing them. This very hurtful prejudice arises from the want of educational enlightenment among the cultivators of the earth and of animals, which is unable to see the advantages of the improvements, but sufficiently strong to resist the dictates of reason and experience. But, as has been before observed, the first improvement must be done on the condition of the land, which has to support animal existence.

Lean animals are of necessity produced by localities where, by reason of the natural formation of the ground and the geographical position, the necessary articles cannot be produced for the purpose of fattening the animals at the proper age. But, in addition to these localities, which do not admit any other applications, there are many situations of the high low-land character, where the necessary articles are raised, and which are applied to the rearing of animals up to the period of fattening, and which are consequently of a better size and quality than the former, which are nurtured almost wholly on Nature's growth. These two sources afford the supplies of lean stock, and increase with the demands that are made for their produce, in order to yield the materials of fattening on the best grounds of cultivation. Both these sources have increased, are increasing, and will increase along with the greater demand, and with the improvements that are made in every department with which they have any relation. The first will be pushed to the utmost verge of Nature's capability, and in the ratio of the improvements that are done in the daily expanding prospect of human entertainments. Constant observation never fails to make suggestions, which will

meet with attention from the demands that are of daily creation, and which require the most imperative consideration. The limits of the supply from the sources where cultivation is wholly or nearly altogether denied by Nature, may be reached, and the means exhausted; but even in these situations the natural circumstances admit of improvements which have enlarged and will increase the quantity of animals that browse the herbage. Mountain irrigation has been very successful, and the introduction of the Cheviot breed of sheep upon the lower grassy lands has increased both the quantity and quality of the flesh and wool afforded by these localities. The supply of lean stock from this source has very greatly increased, and continues to enlarge as the demand increases, and as the means are developed of sustaining the necessary requisites. Such means must not be reckoned to be exhausted, though they are certainly more confined by Nature's fixed boundary than in more favoured situations, which admit the influence of a greater number of physical agents.

The second source of the supply of lean animals from the highest cultivated lands, and even on grounds of good quality and favourable position, will go on increasing with the superior modes of cultivation which science and experience may suggest and establish, by which a greater number of articles will be produced that are required to maintain animal life. This source of the supply of the raw materials is equally susceptible of advancement as the best lands, where the process of the manufactory is completed by the fattening of the animal; a better cultivation of the soil will raise articles in greater abundance, and of a superior quality for the purposes of use. But on all lands where the rearing of animals is done by the fruits of cultivation, the fattening may be done by the same means; for fattening is only rearing in the superlative degree, and requires a superior mode of using the elements. And on the finishing farms it may be very safely affirmed that the animals should be bred on the ground, which would convert a quantity of cultivated lands into a regular manufactory, in which the raw materials are found and forged for the ultimate purpose. By this means the farmer avoids the frequent losses by jobbing in the markets, owing to the fluctuations in all commercial transactions; and the certainty will be increased of better animals being brought forward under the farmer's eye and constant discrimination. Animals always thrive best on the lands where they are bred: there is ever a very strong and marked identity between the soil and the animal which it rears and feeds, which arises from the food and the external influences to which the body is exposed. The transportation of animals from a rich and mild situation to a poor and exposed locality is attended

with immediate deterioration and ultimate ruin; and if the breed does survive, the qualities are wholly altered, and reduced to the capable standard of the natural provisions. And even when the contrary is practised, as is generally done, the thick and unkindly coat of the half-finished animal requires a "time" to relax the stiffness, and to adopt the resiliency of the recipient of fat, and the weak organs of digestion are unaccustomed to the necessary action of the larger quantity of better food. The altered circumstances are wholly different, and an alteration is required in every function that is exposed to their influence. When animals are bred on the ground the alterations are imperceptible, or none at all: the rearing is a partial and preparatory feeding, which is finished by regular and continued gradations from the birth of the animal upwards. The onward progress of the animal is not exposed to any violent changes, either in the food or in the influences of external agency; the organic functions are not oppressed by the appropriation of larger and better supplies of nutrition. A vigour of constitution is most essentially necessary to the thriving of any organic body, and that vigour in every peculiar situation will be most fittingly obtained by being procreated under particular influences of exposure. It is a very important point in the successful nurture of animals that no stoppage takes place in the onward progress—that the food and treatment be regulated to the capabilities of age, and that the advancement be regular and constant. There cannot possibly be a greater blunder in the management of animals of any kind than to pinch the quantity of food, especially in the first year of existence: a stunted growth never attains a profitable bulk, and the flesh is juiceless, meagre, and dry in the fibre. The first step is in the calf sucking the dam, as before mentioned, and the successive steps consist in a regular supply of juicy food in the esculent cultivated green crops. Animals that are bred on the land enjoy all these advantages, from the birth upwards, and yield a full fruition of their use; whereas strange animals are wanting in the primary treatment, and are unable to derive the benefit of the last portion of the system. Every locality in Britain affords materials for raising the identical local breed of animals, if the best be selected for the purpose of procreation; and this system being perseveringly adopted, every situation may have its own breed, which will enjoy many advantages over foreign importations, unless the qualities be not very dissimilar, and habituated to influences that are not very widely distant. Any farmer is able in this way to raise a breed of his own selecting, rear them to the proper age, and fatten the number that can be supported by the utmost possible cultivation of the land. This system being properly

arranged and correspondingly carried out applies the land to the legitimate purpose, or the mine and the workshop of food for the population of any country.

All organic bodies are subjected to the universal law of a fixed period of existence, when the active powers of advancement are exhausted, and decay commences. Reproduction is the grand object of Nature, and that purpose being accomplished, all the different species of organized Nature die, and afford, by the decomposition of their bodies, new elements of life to the succeeding generations. Vegetables are pushed to the point of the seed being matured, and fit for future propagation; the body then perishes, and next season other bodies are raised from the seeds that were produced. Animals are under the same regulations—each genus differing in the length of the periods of maturity, and liable to alterations by the effects of cultivation. All bodies that are quick in growth are shorter lived than slow-growing bodies, whose elements are longer in being knit, and are more rigose and durable after being connected. A refinement in the organization of animals, and improvements in their treatment, and also in the quality of food, naturally urges progression to maturity, and produces the quality of the elements being more loosely connected than where a longer time is spent in the collection and arrangement. An early maturity is most desirable in every case of progressive advancement to a certain point, and in the case of animals it remains to determine the point at which the carcass has reached the period of being most useful, in relation to cost of keep for the time past, and of prospective value for future progress. Even in the most improved state, animal flesh requires a certain time to reach the condition of profitable use, and to unite the quality of consistency with the juicy mellowness of youthful vigour. A proper ripeness cannot be obtained until the constituent parts have had time to incorporate: a forced earliness induces the separation of fat and lean, and the collection of the former in lumps and clusters. Very early maturities are to be avoided, as producing flesh of an inferior quality, and not allowing time for the development of the valuable parts of the animal on which the quantity is borne. In the case of cattle of the most improved breeds, the age of four years may be stated as the most proper time of being finished in fattening: the animal has had four summers, and as many winters, in which to collect and arrange the materials, and the period is very distant when retrogression would commence. This was the opinion of the late Earl Spencer, and no higher authority can be given. It may be suggested that a year more would not be misapplied in the most improved cases, both of the animals and the treatment; the flesh would be firmer,

and the juices more concentrated. In the case of Highland-bred cattle, of any denomination, the age of five or six years is required in order to develop and bring forward the qualities that are slower in growth, owing to the coarser organization, the inferior quality of the food, and the rougher external influences to which the animals are exposed. The flesh of these animals is more "marbled," or streaked, than in the early matured breeds; the fat and lean are more regularly mixed, which is owing to the time that is allowed to arrange the parts of composition. Consequently these animals, when they have been well kept on their native grounds, and are afterwards finished in the fattening on lands of a richer produce, yield the best meat, in the quality of the delicate fibre and juicy flavour. But they are spoiled in this superior quality by being starved on the native grounds, on the plea of being only reared there, and are then sent to the lowlands to be fattened. This latter process hardly recovers the effects of early starving, and is by no means of sufficient duration to produce a carcass of useful parts. Hence arises the very inferior quality of a great part of meat that is used, and hence comes the deleterious effect on the human frame. Equally objectionable is the production of lumps of fat and oily secretions, by the earliness of a forced maturity; these parts are comparatively of little value, and bear no useful comparison with a weight of flesh of regular mixture of fat and fibre. A carcass is much the most useful that has all the bones covered with flesh, the fat regularly distributed, and the inside richly furnished with loose secretions, rather than the outside clustered with useless lumps. In order to attain these qualities, the time that is necessary must be allowed.

The improved breeds of sheep are under the same predicaments as cattle—the same means have been used, and the same results have happened. The Leicester breed is something earlier than the South-down, though in many situations the difference will not be perceived. The very early maturities produce a flesh wanting in firmness and deficient in the enduring quality as food; and the fat is not mixed with the lean, as in the same case of cattle. Experience has fixed the best maturity at the age of two years, or after the second fleece is shorn: very abundant turnip districts will fit the animal for use with the fleece on their backs. The bulk that would be acquired after that age, and the quality that the flesh might collect, would not repay the cost of maintenance and the risk of existence. The Highland breeds of sheep are slower in growth, and require two years more; the Cheviot breed is best at the age of three or four years; and the Welsh and Scotch hill sheep at four or five years. When prepared before that age, by means of richer food, no advantage

is derived; the flesh is smaller in bulk, lighter in weight, and wanting in juicy firmness.

The same observations are applicable to swine. A time must be allowed in which the flesh may acquire substance and firmness, and the food must be selected which will produce that effect. The pig is best fattened after the age of one year, and from that time till the expiry of two years. It is a delicate and

short-lived animal, quickly matured, and soon decays. The early flesh is very deficient in substance, and it soon contracts the toughness of age, when the period of ripeness has been passed.

In every kind of animal life a maturity must be allowed to reach a full ripeness, but not to run into the change that quickly follows the completion of Nature's object.

## THE WHEAT PLANT.

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

At a period when incessant rains have so largely retarded wheat sowing, a few pages taken from a little work on which I am now engaged, may be useful for those for whom I have so long had the pleasure of labouring.

The varieties of wheat commonly cultivated in this country may be divided into two chief sections—the red, and the white. Of these the red is by far the most extensively sown, since the most remunerating crops of white wheat are only raised in certain lands.

With this distinction, the varieties of wheat used by the English farmer are very numerous—they are many of them well adapted to certain soils and climates, and too often are continued in cultivation by the mere force of custom and prejudice, when other and better varieties have arisen which might much more profitably, to the cultivator, take their place.

The following varieties of the genus *Triticum* are enumerated by Professor Low as admitting of cultivation for their seeds:—

1. *Triticum aestivum*—summer wheat.
2. *Triticum hybernum*—winter or Lamma wheat.
3. *Triticum compactum*—compact wheat.
4. *Triticum compositum*—Egyptian wheat.
5. *Triticum turgidum*—turgid wheat.
6. *Triticum atratum*—dark-spiked wheat.
7. *Triticum hordeiforme*—barley-like wheat.
8. *Triticum lea*—far.
9. *Triticum spelta*—spelt.
10. *Triticum monococcum*—one-grained wheat.
11. *Triticum polonicum*—Polish wheat.

*Triticum aestivum* (Summer wheat) is the description cultivated in the warmer wheat-growing countries. Its vegetation is completed in a much shorter period than any of the other varieties. Its produce, however, both of seeds and straw, is smaller than that of some of the winter varieties. It may be sown, however, late in the spring; and it ripens early. In this island it can be successfully sown as late as the beginning of May.

*Triticum hybernum* (Winter or Lamma wheat).—This is distinguished from the spring wheat by

ripening more slowly; it has usually five or six florets, of which two are barren.

*Triticum compactum* (Compact wheat) is probably only a variety of the two last named.

*Triticum compositum* is remarkable for possessing a branched or compound spike. This is what no other variety produces; and even this species does not do so but in a good soil and favourable climate: then its produce is abundant. In less favourable situations the appearance of the wheat is the same as the ordinary kinds. It is the wheat chiefly cultivated in Egypt, and the south of Europe.

*Triticum turgidum*, or turgid wheat.—This is the Rivet, Grey Pollard, Duck-bill wheat, &c., of the British farmer. It is a bold, tall-growing wheat, abundant in straw and in seed, but the last is coarse. They are largely cultivated on the stiff clay soils of England.

*Triticum atratum* (Dark-spiked wheat) is regarded by Professor Low as closely allied to, if not a variety of, the turgid wheat.

*Triticum hordeiforme* (Barley-like wheat), so named from its resemblance to barley, is supposed to be of African origin. It bears a close resemblance to spelt wheat.

*Triticum lea* (Far) is of the class of spelt wheats, and distinguished by its spikelets being closely attached to the rachis. It is cultivated successfully on some of the inferior European soils.

*Triticum spelta*, or spelt wheat is distinguished like the last named. This is a hardy wheat, and is extensively cultivated in the south of France, and in the northern Spanish provinces.

*Triticum monococcum*, or one-grained wheat; it is cultivated on some of the poorer soils of Europe, but does not appear to possess any very remarkably good qualities.

*Triticum polonicum* (Polish wheat).—This is extensively grown in Poland and Germany; it has also been tried in England. Its produce of flour is considerable, but its florets are too often infertile.

There appears to be little real difference between winter and spring wheat. The produce of wheat



sown in spring (observes Professor Low) acquires the habit of ripening earlier than the produce of wheat sown in autumn; hence the farmer, when he sows wheat in spring, should sow the produce of that which has been already sown in spring, and not the produce of that which has been sown in autumn. This change in the habit of ripening takes place in the case of all the cerealia, and many other cultivated plants.

On a farm of 400 acres of ordinary fertility, remark Messrs. Way and Ogston (*Jour. R. A. S.*, vol. vii., p. 654), and cultivated on the four-course system, we might fairly consider that the average produce would amount to 28 bushels per acre, each bushel weighing 61lbs. On the calculation of the proportion of straw and chaff already deduced from our experiment, their united weight from the 100 acres (the grain being in weight  $75\frac{3}{4}$  tons) would amount to rather more than  $95\frac{1}{4}$  tons, including  $14\frac{3}{4}$  tons of chaff. Were, however, the weight of straw and chaff to be, as is supposed, at any time equal to twice that of the grain, instead of  $95\frac{1}{4}$  tons the quantity would be 152 tons.

At the same time we must in fairness remark that all observers agree in ascribing to the character of the season the most marked influence on the quantity of straw in relation to the grain. Boussingault mentions crops grown at Bechelbron, in two consecutive years, which differed most materially in this respect. In the first year (1840-41) the season was very wet; the second (1841-42) was remarkable for extreme drought. In these opposite conditions the weight of grain to straw was—

In 1840-41.....	as 100 to 40
In 1841-42.....	100 900

or to state it another way,

In 1840-41...1000 grain to 4162.2 straw
In 1841-42...1000 " 1116 "

Boussingault states the ordinary relation of straw to grain at Bechelbron to be—grain 1000, straw 2631; and he quotes in support of this being the probable average the following results of other continental observers:—

Thaer, grain 1000—straw	2000
Podewils, 1000	2857
Berger, 1000	2292
Block, 1000	3030
Dierexen, 1000	2564
Schwartz, 1000	2272

It is not stated whether the chaff is included in this calculation, but we suppose that it is. One valuable variety of spring wheat, the Belle-vue Talavera, is thus described by Colonel Le Couteur, in his prize essay on several new varieties of wheat (*Journal R. A. S.*, vol. i. p. 119): "This variety was raised from a single grain. This admirable variety is invaluable, where it is adapted to the soil and climate.

"This wheat has succeeded in the north of Scot-

land, and is sufficiently hardy to withstand the winter in its grassy state, but it is otherwise more valuable as a spring crop: without doubt it may be sown as late as the first week in February, in all the milder parts of England, with a prospect of reaping quite as good an average crop from it as from any other wheat, but with a certainty of obtaining more flour than from most. A celebrated Scotch agriculturist wrote of it on the 12th of September last—"Talavera is nearly ripe; but such has been the untowardness of the season, I do not expect any other wheat to make any return." This testimony is in favour of its early habits and hardihood also. It is what the French have long sought for—both a winter and a spring wheat.

"The wheat appeared in 25 days, on the 1st of March; it was in bloom on the 30th of June, and was chopped on the 17th of August, a week sooner than the Whittington, which was sown nearly a month before it.

"There is no tendency to degenerate observable in this wheat, as far as the experience of five or six years goes; nor from its early habits is it at all likely to become intermixed by fecundation from other varieties, though sown about the same period, as it will, in such cases, flower a fortnight or three weeks before them. It is not more liable to disease than ordinary white wheats, and affords a very fine, clear white straw: it is indeed one of the Italian bonnet making-varieties. There is, however, one disadvantage in it, which is, that the ear is so heavy that it is apt to break down, though not break off, when swept by a gale about the period of ripening; but it has a countervailing good quality, of ripening the grain equally well though bent down; as is the case with spring wheats, which ripen their seed well though quite laid, which with winter wheats is doubtful. Another peculiarity is the tenacity of the chaff to the ear, more remaining on it after passing through the threshing-machine than any other variety I am acquainted with.

"The amount of produce in grain was 52 imperial bushels to the acre; the grain is so large that it tells in the measure; the sample very beautiful, as a bushel of it, to be produced at the Oxford Meeting, will show—uniform, clear, and thin-skinned. Hence the weight in grain at 61lbs. the bushel was 3172lbs., the weight of chaff 282lbs., and of straw 5480lbs. The quantity of flour obtained was 2485lbs., the quantity of pollard 38lbs., and of bran or offal 588lbs. The bread made from this flour is incomparably the best that I ever met with; it is light, very white, and preserves its moisture almost as long as bread made from spring wheat. It is, moreover, so sweet and well-flavoured as to appear to some palates more like cake than ordinary bread. Independently of the large proportion of

flour it affords, it makes much of this fine bread; 18lbs. of the flour, having absorbed more water than the last described, gave 25lbs. of bread.

<i>Crop.</i>	£	s.	d.
48 bushels, at 8s. per bushel. . . . .	19	4	0
4 ditto tailings, at 5s. . . . .	1	0	0
Straw, 48½ cwt., at 1s. the cwt. . . . .	2	8	9

Charges to deduct, as per Whittington. . . . . 14 0 0

Profit. . . . . £ 8 12 9

“The weights of 18lbs. or 27lbs. used for the flour to be baked are intended to be comparative experiments of weights of nines, it being generally under-

stood, especially in baking bread and serving it out to troops, that 9lbs. of common flour will make 11lbs. of bread. All those, however, that I have experimented on afforded more: the two lowest having afforded, from 18lbs. of flour, 22lbs. 9oz., and 23lbs.; the former of my own growth, the latter made from wheat imported from Rostock and Dantzic mixed.”

The sowing of spring wheat will in all probability be this year very considerable, on every soil adapted for its growth; every fact therefore which tends to aid the farmer in the novel circumstances in which he is now placed will hardly fail of being productive of good.

WHAT SCIENCE MAY DO FOR AGRICULTURE—ILLUSTRATED IN RESPECT TO THE ARRANGEMENT OF HOME-MADE MANURE.

BY AN EX-FARMER.

The application of the sciences to agriculture has now had a pretty good run of attention and discussion. Many have been the experiments of the enthusiastic, and anything new that has found its way into print from some heated brain, has been tried with certainty of success by these “experimentalizers,” as they term themselves, but who, too often for their own scientific reputation, proved that their seats of intellect were scarcely less properly tempered for exercising that calm judgment which is necessary to successful cultivation of land. As often as these men have become farmers in the application of sciences, so often have they fallen, and as rapidly, after reaching the uppermost point, unless their schemes were protected by the “sinews of display.” It would be useless to give a list of names, and the numerous technical terms of the projects that have been “established.” Both names and schemes have fallen a prey to Time, the element of Nature that brings the action of mankind to proof; and already some of both the former and the latter have ended their existence, and the remainder are lingering out their pampered lives, struggling hard to ward off that which is sure to arrive, and effect what is sometimes somewhat stingly termed “a natural death.” Nature will follow her course, let the attempt to divert her be what it may; and she will take her time, let the desire and means used to hasten her be as strong as possible. Earth and air cannot be made into wheat, by the same powers that this produce can be manufactured when gathered: and meat must have the time to grow that nature allotted to it, or it will be *unnatural* food, and therefore not suitable to the nature and habits of men, for whom it was sent.

In applying the sciences to agriculture, the influence of scientific productions upon the human frame

must not be forgotten; and it is perfectly clear to such minds as have considered these things in all their bearings, that the same irritability, nervelessness, and physical weakness in general, that are exhibited by the inhabitants of pent-up hovels and thickly populated towns, are produced, or rather suffered to exist, when such food is eaten as was produced without having the due influence of natural elements. It may be said that this is overdrawn; however, when men pretend to be scientific, they should not confine their thoughts and considerations to the mere production of *weight* and *bulk* of such things by means of which mankind live. And as this is a scientific journal of agriculture—such questions as these must not be forgotten, when anything of the kind is introduced into its pages in the form of discussion. Furthermore, as this journal has great influence on what systems are pursued throughout the country, as the influential agriculturists of all counties and districts study its articles; what is hollow in practice, and which science can detect, must be exposed as we go on; for if this hollowness be left to be discovered by experience, what will be the amount of the loss incurred by both producers and consumers? I have not the slightest hesitation in saying, that if the schemes recommended by many “scientific persons” were carried into practice throughout this country, our cattle and corn would be affected with all sorts of diseases, and the inhabitants would become nerveless and irritable, and incapable of prosecuting the necessary occupations of life. These things would happen, even as the population of cities would become extinct in a few generations, if calmer temperaments and stronger constitutions were not infused by the migration of country-bred people. What the next generation of scientific agriculturists will

think of the notions that prevail in these days, I am at a loss to conjecture! But, when a proper enquiry has been made, and the present narrow ideas have vanished, and more comprehensive principles have taken their places, then will the application of the sciences to agriculture be available, as they will point out the way by which *nature* may be followed with more certainty than it can be without such knowledge.

The true meaning of scientific agriculture, is a knowledge of the manner in which plants are formed of earth and air, and how animals are supported by eating them. To practise this knowledge, is to facilitate nature by legitimate means, and not to turn things up-side down, as a feverish imagination may suggest. Many principles may be formed by this enquiry, and discoveries made; but these must be applied to the improvement of approved practice, and not to the overthrowing of all past experience. What practical chemistry may discover by way of artificial manure, in the form of alkalis, and silicates, is apart from the study of the scientific agriculturist, as the cultivators of the soil will never become practical chemists. An explanation of what the commodity manufactured is composed of, will be enough for a farmer, when an elementary knowledge of scientific agriculture will enable him to apply it as his experience.

An important description of the way in which the sciences may assist agriculture, I am now about to give; and this is only one of the many expositions that a close inquiry into the subject naturally effects. Practical farmers have been in the habit of applying opposite qualities of soil to fields, with a view of improving them, as clay to light soil, and sand to clay and bog earth. This method of increasing the quantity and improving the quality of grain has invariably been effectual. Now, the question is, how has this method acted advantageously? The principal cause has been a *chemical action*. It is true that a good coat of clay on sandy soil will make it more retentive of water; and a good covering of sand on clay will make it more porous, and therefore cause the air to circulate through it more freely, increasing oxidation and absorption of carbon. But it is the chemical action of the opposite quality of soil that causes the improvement of quality; therefore, we must enquire, of what this chemical action consists.

The chemical term for the oxide of clay is alumina, the base of which is aluminum; and the peculiar influence that the oxide of this base (alumina) has on vegetation is, it makes it tough and more insoluble than that which grows on mixed or sandy soil. Some popular professors of agricultural chemistry state in their works, that it cannot be detected, that alumina exists in, or forms any part of, any kind of

vegetation. But there are numerous open proofs that it has an important influence on nearly all kinds of vegetation. Timber and straw are, and grain itself is, tougher when grown on this soil, which can be proved by boiling the latter; as white peas will not dissolve when they grow on this kind of soil: therefore, if analytic chemists cannot detect it in vegetable matter, it must arise from their want of skill, as peas grown on sandy or other light soil will dissolve readily. Alumina is formed, too, by the action of the acid that is exuded from the roots of plants, and also by the decay of roots left in the soil after the crops are taken off. A quantity of clay on very light soil is soon dissolved by these means, as the affinity acid has for it is great, whilst sand retains but a small quantity of carbon, which is proved by its never acquiring a very dark colour. Whilst this clay is present in the soil it was spread upon, the crops will be better than where no foreign compound has been applied. It does not matter particularly how long a given quantity of clay upon an acre would last, so long as we know that it would be gradually consumed, so to term it, by the crops sown on the soil containing it. The amount of cultivation, and kind of crop sown, would vary the time it would last. It is enough to know that it improves the crops, and how this is done.

Sand, or silica, as it is technically termed, acts in the same way in respect to improving crops; and this is done by dissolving, so that it suspends in water, which is thereby sucked up by plants, in connection with the dissolved clay. It requires no further argument to show that it is the chemical action, and not the mechanical, that effects the superior quality of straw and grain, when soil is applied to opposite qualities. Every farmer and miller knows the difference in the appearance of wheat that grows upon clay, sand, or soil that contains a large percentage of fixed air, and which is commonly termed boggy or peaty soil. The productions of these qualities of soil seldom or ever make a first-class quality of flour; and as this is also known, a mixture of different and opposite qualities is generally made, when a good sample is produced. The effect realized by this mixing arises principally from the influence of the *earthy* properties of the flour upon each other, as the atmospheric agents are always the same, let the earthy matters of the same kind of plants be what they may; and there is generally very little variation in the proportions, although the *quality* of carbon is very much influenced by the heat and dryness of the season, and so on. The counter-action of the supposed extreme compounds of the soil on the fermentative agent (carbon) of the bread, during the process of manufacture, is why a mixture of extreme qualities answers so well. This is why foreign wheat and flour improve our English so much.

Our superior cultivation and produce of green crops have made it necessary to use some alkaline or mineral compound, as alum, unless there was to be obtained such wheat as grew upon soil that contained a greater amount of alkaline or developed earthy matters than fixed air. It will be perceived by this, therefore, that much of the plausible argument about the use of alum being so injurious is fallacy. It made the bread more wholesome, when the superior cultivation of English soil produced enough food for its inhabitants. There are several pounds of alum in a sack of flour that grew on an ordinarily cultivated clay soil. Aluminum, alumina, and alum, are merely terms used to distinguish the degrees and qualities of an element of the earth, as it is changed by natural influences and art. Grain is formed partly of earth as well as air, and alum is only earth purified. What then can be adduced to prove it to be injurious, when judicious quantities are used? In a wet and cold season, bread would often produce diarrhœa, unless such a mineral were used, to govern the acid the bread would contain. Medical men may, however, get up a "popularity letter" for the paper of their neighbourhood, that will afford some pleasure to the consumers at the expense of the bakers; although the latter may, at the same time, have lessened or prevented much sickness, and this too by the use of alum. Good bread must be made; and to accomplish this, it is necessary to resort at times to artificial correctives. Too much may be used by persons ignorant of its effect; but no great evil arises here, for such bakers loses their trade. However, now that foreign corn is so abundant, it is seldom required, and smaller quantities are generally used; and in seaport towns, where much foreign "bread stuff" is imported, it is entirely dispensed with in many instances, as half foreign and half English flour is used; and a small quantity of Indian corn (as it is often called, although much of it is grown in America), is used by millers, when their flour would otherwise be too "soft," or too fermentative.

This indirect discussion has so fully exposed the effect of one property of the earth upon another, and the counter effect of these on the qualities of the fixed air they are united with, that a few words will suffice to show how the producer of food or the farmer may not only improve the quality, but increase the quantity of it by a little preconsideration and display of skill. There are very few farms, the soil of which is uniformly alike. Every variation of soil produces, not only a different quality of grain, but straw also. The principal difference lies in the earthy constituents of it, whatever they may be. If it grew on clay, it will contain alumina; if on sand, soluble glass, as it may be termed; if on bog earth, but little earthy matters will be present, as this is principally composed of air, as I have said;

therefore, its quality will be very different to the two former, which is always indicated by the softness of it to the feel when squeezed in the hand. These qualities are about the extreme qualities that are found on farms, and to reason upon them will suffice to develop the principle in view.

The straw of a farm is that portion of its produce that is returned to the soil, as a manure to increase production. Now, it is the earthy properties that have the most influence when it has fermented and decayed, as the carbon that united with them has been taken away as grain, and they are left to act again in the formation of plants and grain, by attracting and governing carbon after the usual process of plants' growth. Therefore, it is perfectly clear that such an arrangement should be made at harvest time as will admit of the straw that grew on one extreme quality of soil being made into manure, so that it can be applied to another extreme character of soil. If the field to be manured first is a clay soil, then the corn that grew on sandy or gravelly soil should be put into the barn, as it may then be thrashed first, and the manure it is made into applied to the clay field. If the contrary to this supposition should be thought proper, then an opposite arrangement of corn must be made. And if there is any boggy or peaty soil on the farm, the produce of straw on it should be applied, not to mixed and rich soil, but to sandy or gravelly, as both of these are generally deficient in "vegetable matter" (as it is erroneously termed) or fixed air; and the produce of this soil contains, as we have seen, air united together, or formed into gum by the influence of heat unassisted by earthy matter.

A little individual consideration will make this reasoning seem to be of some considerable importance, although at first it may be read suspiciously by those persons who change their systems with due care. There are many months before harvest will be begun, and an occasional return to this subject will, I am sure, fix it as a principle in the mind of every reader who desires to improve his crops without an outlay of capital or hazard of failure. There is this in favour of the sceptical, in respect to the sciences: in this practice on the strength of them no injury can be done; whilst, by the application of guano and artificial manures, less corn is often produced, and still oftener no profit is afforded. It must not be understood that this implies that a change of straw from light to heavy soil, and *vice versa*, will do as much good as a good covering of soil after the same rule would; as clay on soil of a light character assists the growth of plants on it, by retaining a greater amount of moisture and acid, as it is particularly adapted for holding both in union with it; and sand, as shown, makes stiff soil like clay more porous, and admits of the action also explained. But

to improve a field by these means is very expensive; whilst the same *chemical* advantage—and which will prove in the long run equally effectual, as the greater produce of straw will make more manure—may be obtained by a slight exercise of mind, and arrangement of stacks and manure, and this, too, without the slightest inconvenience to cattle in the home-stead, or outlay in implements, or as a permanent improvement. Any one that may feel disposed to carry this out (and who will not, where it can be done?) must do so by the force of his own reason; and he must also be satisfied after the same manner,

for it will be impossible to test this by weighing and measuring—two operations that are of very little use in the broad principles of managing a farm, as what answers as an experiment one year fails the next. And I think I may conclude now with the satisfaction of knowing that I have said enough to impart this novel principle to the reader, and also to show him its importance; and having done this it will be practised, and although he cannot report that he grows more corn to a named amount over what he has hitherto done, he will be capable of perceiving that his crops improve year by year.

## AGRICULTURAL BIOGRAPHY.

(Continued from page 25.)

### C.—WOOD, 1757.

Weston states John Wood to have been the author of "New compendious treatise of farming," in 8vo. No other list of books or authors contains this name or title; the Bibliotheca Britannica gives to John Wood "Compendious treatise on farriery," in 8vo., 1757, and as the statement differs from Weston only in farriery for farming, the supposition may be just that the person is the same, and that Weston may have inadvertently placed farming for farriery.

### CI.—BROWN, 1758.

Weston makes R. Brown, of Hill Farm, Somersetshire, to be the author of "Complete farmer;" 2 volumes, in 12 mo., price 6s. The name of this author, and title of the work, have no other authority that can be found.

### CII.—MORRIS, 1759.

Corbyn Morris, Esq., F.R.S., wrote "Plan for arranging the accounts of landed estates;" London, 1759, folio. This author wrote on various subjects, as insurance, the currency, growth and policy of large cities, and the laws of mortality. The accounts of a landed estate occupy 39 folio pages, and contain a Dr. and Cr. side of sums and disbursements, in which are entered all receipts and payments without exception, and having annexed the particulars of every transaction. Next is an entry-book, with each farm on the estate separately placed on both sides of the account, the receipts from the farm occupying the Dr. side, and the Cr. side showing the disbursements made from the special extent of ground. The abstract shows the succinct state of all the branches in any period, best of one year—the Dr. side exhibiting a list of all the branches of the estate, and of the several tenants or agents, with the gross income, and any casual produce attached; the Cr. side shows the gross receipt during the fixed period, so

that the gross income and gross receipt are easily compared.

The author possessed a landed property, and devised this account book for his own use, and it has a very considerable merit.

### CIII.—NORTH, 1759.

Richard North, nursery gardener, near Westminster Bridge End, Lambeth, wrote "An account of the different kinds of grasses propagated in England for the improvement of corn and pasture lands, lawns, and walks, with directions for sowing and manuring them; and an account of the sound-growing Norfolk willow, with directions for propagating it with advantage, the whole chiefly done from the observation and inspection of the author;" London, 1759, 8vo., price 1s. This writer is mentioned by Weston, and in the Bibliotheca Britannica, but the book is not found in the libraries of the British Museum.

### CIV.—MILLS, 1759.

John Mills, F.R.S., must have been a person of very considerable eminence, though no record exists of his life, except the bare name as above quoted. He was member of Royal Agricultural Societies of France and of Berne, and shows a comprehensive knowledge of the cultivation and use of the ground; he wrote "A new and complete system of practical husbandry, containing all that experience has proved to be most useful in farming, either in the old or new method, with a comparative view of both, and whatever is beneficial to the husbandman, or conducive to the ornament and improvement of the country gentleman's estate;" London, 1763-5, 5 vols., 8vo., price 30s. A treatise on cattle, showing the most approved methods of breeding, rearing, and fitting for use horses, asses, mules, horned cattle, sheep, goats, and swine, with directions for the proper treatment of them in their several diseases. To which is added

a dissertation on their contagious diseases, carefully collected from the best authorities, and interspersed with remarks." London, 1776, 8vo., price 6s. "An essay on the management of bees; wherein is shown the method of rearing these useful insects, and that the practice of saving their lives when their honey and wax are taken from them was known to the ancients, and is in itself simple and easily executed;" London, 1766, 8vo., price 5s. "An essay on the weather, with remarks on the shepherd of Banbury's rules for judging of its changes, and directions for preserving lives and buildings from the fatal effects of lightning;" London, 1770, 8vo., price 2s.

Mills translated "Duhamel's husbandry;" London, 1759, 4to., price 16s. 6d. And also "Natural and chemical elements of agriculture, from the Latin of Gustavus Adolphus Gyllenborg;" London, 1770, 12 mo., price 2s. 6d. He was the reputed author of some essays, moral, philosophical, and political.

The five volumes of a new and complete system of husbandry, by Mills, is the first publication on agriculture that presents all the branches of the art within the compass of one work. Worlidge began the attempt, but failed in the comprehension that is required. The first volume of Mills treats "soils" in the different kinds, clays, sands, and loams; manures, animal and vegetable, and composts; of the improvement of moors, and boggy lands and all uncultivated lands; the culture of grain and pulse; the sowing and change of crops; the culture of wheat, and rye, oats, barley, maize, or Indian corn, millet, panic, rice, buckwheat; culture of pulse, viz., beans, peas, vetches, lentils, and lupines.

Volume II. contains the horse-hoing husbandry of grain and pulse; the distempers of corn.

Volume III. treats the enemies of corn; preservation of grain, turnips, potatoes, cabbages, clover, sainfoin, lucern, cyttisus, burnet, natural grasses; enclosing, and the situation of farms and farm houses.

Volume IV. contains "Gardening, and the culture of hops and olives."

Volume V. treats "The making and managing of fermented liquors," and concludes with hemp, flax, madder, woad, weld, or dyer's weed, and a long appendix to each volume.

Mills leads all the previous authors in the arrangement of his work, which undoubtedly carried away the palm of agricultural writing at the time of its appearance. He joins extensively with Evelyn and Duhamel, and does ample justice to the system of cultivation proposed by Jethro Tull. Turnips and potatoes were in general use, and the

Rotherham plough is figured in the work, as are also thirteen of the natural grasses.

Potatoes are entered in this work for the first time as a vegetable in the field cultivation, being about 150 years after the use of the plant was known as an esculent root. Mills quotes the authority of Miller in proof of its value and extensive utility.

This author conveys his meaning and intelligence in the true style of writing—cool and plausible, and with becoming diffidence on all scientific disquisitions. No dogmatism mars the placid tenor of his story.

The treatise on cattle is an octavo volume of 491 pages, and treats horses, asses, mules, horned cattle, sheep, goats, and swine, with the cures of their disorders, which have a dissertation on their nature. The matter is more descriptive than that of Bradley, but not so practical in the application, though much merit is attached to the knowledge it shows of the origin and progress of the different animals.

Mills was a great stickler for small farms, almost cottier allotments; he did not see that any single bodily labour can effect but very little unless in combination, and that extensive projects employ most labour, and produce the largest results. A thick mist long clouded the human vision on that and similar points, and is not yet dispelled.

#### CV.—BALL, 1760.

Weston writes Ball as the author of "An essay on agriculture," in 8vo., and "The farmers' guide," in 8vo. It appears that John Ball was an apothecary, and wrote several works on that business, but the list of them does not contain the two works on agriculture, as above noticed. The libraries of the British Museum do not possess the books, and the use of the name rests on the sole authority of Weston.

#### CVI.—HITT, 1760.

Thomas Hitt was gardener to Lord Manners, at Bloxholm, in Lincolnshire, and wrote "A treatise of husbandry, on the improvement of dry and barren lands," London, 1760, 8vo., price 2s. 6d. The author was a native of Aberdeenshire, and after much serving as a gardener, he became a nurseryman and designer of gardens in Kent. He died about 1710, and it appears the books were afterwards published from the M.S. found after his death. His treatise on fruit trees was much esteemed.

The treatise of husbandry makes a volume of 208 octavo pages, showing the many advantages which would arise to the nation in general by destroying of warrens and converting the lands into tillage, pastures, &c; pointing out new and cheap

methods to make growing fences upon the most barren soils, and how to till and manure the same at a low expense. How to prepare the land, and raise upon it various sorts of plants to produce both poles and timber. The author writes very pertinently on enclosing waste lands—bringing the grounds into cultivation, and the raising of timber trees.

CVII.—ROCCUE, 1760.

Bartholomew Rocque, of Walham Green, wrote "A practical treatise on cultivating lucerne grass; containing such methods as are found by experience to succeed, including the practice used in several parts of France; and some hints relative to Burnet and Timothy grass. The whole essay occupies only 45 octavo pages of very sound directions on the cultivation of the specified vegetables, which have not been superseded by the best modern practice.

The ground must be deeply ploughed or trenched for lucerne, thoroughly cleaned of weeds, and minutely pulverized, and the bed of plants scarified by harrowing, and top-dressed with a fine manure, after the mowing of the herbage.

CVIII.—MILLER, 1760.

Philip Miller, F.R.S., was a celebrated gardener and botanist of Chelsea, where he was born, 1691, and died 1771. He was author of several first-rate works on gardening—translated the "Elements of agriculture" from the French of Duhamel, and published the "Method of cultivating madder in Zealand and in England." Miller's direct aid to agriculture was not large, but as he did look into it, and his labours bore not very remotely upon its illustration, a place is always given to his name among agricultural authors.

CIX.—MORDANT, 1761.

John Mordant wrote "The complete steward, or the duty of a steward to his lord; containing several new methods for the improvement of his lord's estates; showing the indirect practices of stewards tending to lessen any estate, with tables for the measurement of timber; interest of money, and the value of ancient and modern coin compared. Together with several law precedents relating to the duty and office of a steward." London, 1671, 2 vols., 8vo., price 12s.

The above statement of an author and his work is used by Weston and Loudon, in their lists of British writers; and is also printed in the *Bibliotheca Britannica*. But the libraries of the British Museum do not contain any book or author of that name or title; and a regret may be expressed for the absence of a work which from the contents of two volumes might have conveyed some intelligence of the systems that were pursued and con-

templated in those days in managing the estates of land.

CX.—STILLINGFLEET, 1761.

Benjamin Stillingfleet, grandson to the Bishop of that name, was an ingenious naturalist and miscellaneous writer; born about 1702, died about 1771. He wrote on various subjects, and was the author of "Miscellaneous tracts relating to natural history, husbandry, and physic." The second edition was illustrated with copperplates of the British grasses, and the work was printed both in Sweden and Denmark. Weston ascribes to Stillingfleet "An essay on the theory of agriculture, intended as an introduction to a rational system of the art;" in 12 mo., price 3s. No other notice appears of this essay in any list or library.

Stillingfleet's observations on grasses are very correct and judicious. He thinks scarcely half-a-dozen plants admit cultivation by the farmer. The figures of the plants are fairly executed. This short treatise led to the subsequent works on the subject.

CXI.—FARMER OF MANY YEARS, 1762.

This name wrote "A treatise on agriculture;" Edinburgh, 8vo., 1762. The work occupies 427 pages octavo, and the contents are divided into four books. 1. Of vegetation; 2. Of tillage; 3. Of manures and their operation; 4. Of soils.

The author manages all these subjects in a superior manner, and the work was much estimated by the Scotch society for encouraging arts and sciences; under whose auspices the publication was effected. The dissertation on soils shows no scientific knowledge, but a plain description of very common notoriety. A sprinkling of science adorns the threadbare terms of vulgar phraseology.

CXII.—DICKSON, 1762.

Adam Dickson, A.M., was minister or clergyman of the parish of Dunse, in the border county of Berwick, in the south of Scotland. He was considered a good classical scholar, and an excellent practical farmer. He wrote "Treatise on agriculture;" Edinburgh, 1762, 8vo.; second edition, 2 vols., 1769, 8vo. New edition in 1785.

"The husbandry of the ancients;" Edinburgh and London, 1778.

The preface to the first work is very long, in 65 pages, and the first volume contains vegetation, tillage, manures, and soils. The second treats farm management; culture of particular plants; different schemes of management—improvements in management.

This work says nothing about animals, and consequently does not constitute a system of agriculture. The portraits of the plough show much improvement. The author's ideas are very forward,

and show a large acquaintance with the subject on every point.

"The husbandry of the ancients" was published after the death of the author, and may be wanting on that account. It has always found a high value in having made accessible to all the customs and practice of ancient agriculture; containing the facts expressed in the language of the author. This mode is preferable to a pure translation, as the benefit is derived of the author's observations and professional knowledge. Dickson has ever been very justly reckoned to be a first-rate writer of the time.

CXIII.—MARTYN, 1762.

Thomas Martyn, F.R.S., was the son of the professor of botany at Cambridge, where he succeeded his father in 1761. He took several literary degrees, and was Bachelor of Divinity in 1766. He died in 1825, in the ninetieth year of his age.

Both father and son of this name and profession published largely on botany, and were reckoned persons of talent and high moral worth. Only one work of the son, who is our present notice, has any relation to agriculture, and is entitled "Flora Rustica, exhibiting figures of such plants as are either useful or hurtful in husbandry; with scientific characters, popular descriptions, and useful observations;" London, 1792, 4 vols. in 2, 8vo. The figures of the plants are coloured, and pretty correct in the likeness; but grasses, legumes, and herbaceous plants, are all intermixed, and no distinction is made to separate utility from hurtfulness. Still the work is highly useful, the descriptions are very concise, and the observations most appropriate. The aid of such persons as Martyn is of vast importance in propelling the advancement of a gross art as agriculture.

CXIV.—RANDALL, 1764.

John Randall was some time master of the academy at Heath, near Wakefield, in Yorkshire. He wrote "Semi-Virgilian husbandry, deduced from various experiments, or an essay towards a new course of rational farming, formed from the defects, losses, and disappointments of the old and new husbandry, and put on the true basis of nature in the production of vegetables, and in the power of every ploughman with his plough to execute;" London, 1764, 8vo., price 6s. "Construction and extensive use of a new invented seed furrow plough, suited to all soils—of a draining plough, and of a potato-drill machine, with the theory of a common plough, illustrated with seven plates;" London, 1764, 4to., price 5s.

The preface of the work occupies 52 pages, and enters largely into the spirit of the contents. The whole work is a valuable one, as it embraces widely

the new system of pulverization, or the drill cultivation, and applies it in very tolerable perfection. The author drills the crops of every kind, and scarifies the intervals throughout the summer. A spiky roller is figured, and two portraits of skeleton ploughs for the purpose of moving the intervals of wide drills. The education of the author enabled him to treat the subject scientifically, which he has well performed, and afterwards applied the principles to the field in the process of cultivation. The books are octavo of 400 pages.

CXV.—LADHAR, 1764.

Mr. Ladhur of Kray, in Yorkshire, wrote "The farmer's new guide for raising excellent crops of peas, beans, turnips, or rape; and cleaning the ground while they are growing, to prepare it for raising good crops of wheat, barley, or oats, in the common way of sowing the seeds clear of these weeds, which so often ruin the farmer, or keep him poor, being experiments on the various soils of stiff and light;" London, 1764, 8vo., price 1s. This statement appears in the *Bibliotheca Britannica*, and the author's name is written in Loudon's list of authors, but no other work is attached to it. Weston does not mention the author, and neither the book nor the name is contained in the libraries of the British Museum.

CXVI.—BILLINGS, 1764.

Robert Billing wrote "Account of carrots and their great use in feeding and fattening of cattle;" London, 1764, 8vo., price 6d. The *Bibliotheca Britannica* prints this notice, and Weston does the same: Loudon makes no mention of the author, and the name nor the book are not in the libraries of the British Museum. In this case Weston is supported by the general register.

CXVII.—BOURN, 1764.

Samuel Bourn wrote "Treatise on wheel-carriages, showing their present defects, with a plan and description of a new-constructed waggon, which will effectually preserve and improve the public roads, and be more useful, cheap, and handy to the proprietor;" in three parts; London, 1764, 8vo., price 4s. 6d. Weston and the *Bibliotheca Britannica* are the only authorities for this name, as it is not mentioned by Loudon, nor in any library of the British Museum.

CXVIII.—HARTE, 1764.

Walter Harte was canon of Windsor, and a person of literary note, as was his father before him. He was the intimate friend of Pope, and published essays on painting, reason, satire, and other subjects. He was tutor to Lord Chesterfield's son, who got him the canonry of Windsor. The times of his birth and death are not certain. He died



unmarried, and devoted much time to solitary reading. One notice dates his birth about 1697, and that he died in 1768.

Harte wrote "Essays on husbandry, and a treatise on lucerne;" London, 1764, and 1670, 8vo., price 6s. Weston and the *Bibliotheca Britannica* make this statement; Loudon does not mention the author, and the libraries of the British Museum do not possess the book on agriculture, though the other works of the author are in the catalogue. The essays have always been reckoned good: our own opinion can say nothing of them.

CXIX.—BAKER, 1765.

John Wynn Baker wrote "Experiments on agriculture, made under the directions of the Dublin Society;" Dublin, 1765, 8vo. These experiments form a thick octavo, and contain a mass of information on many points of agricultural practice, Clovers and potatoes are largely treated, and turnips rather slightly. Wheat on fallow and cloverley, is well discussed. On the whole the contents of this work are of the most enlightened practice and prospect.

CXX.—FORDYCE, 1765.

George Fordyce, M.D.F.R.S., was born at Aberdeen in 1736; being the only and posthumous child of George Fordyce, the proprietor of a small landed estate near that city. He was suitably educated for the medical profession, and ultimately settled in London, as practitioner in physic, and as lecturer. He attained a very considerable eminence, and died in 1802.

Fordyce published many works on medicine, which have maintained a just reputation. He had delivered privately to some young friends lectures on agriculture and vegetation, which having been revised and corrected, were published as a book in "Elements of agriculture and vegetation." The bulk is 75 pages of octavo size, and the contents are wholly chemical—on the attraction and dissolution of bodies, substances in soils, structure and economy of vegetables, and nourishment of plants. The little work has always been esteemed as a very scientific treatise.

CXXI.—LIGHTCOLES, 1766.

Weston makes J. Lightcoles to be the author of "The gentleman's and farmer's architecture; being plans for parsonages and farm-houses, with pineries, greenhouses, &c.;" with 25 plates, in folio, sewed, price 6s. No other notice of this author or book is found in any list or repository. Weston often stands alone in this respect.

CXXII.—HOMER, 1766.

Henry Homer, rector of Birdinham, in Warwickshire, an excellent classical scholar, was born

in Warwickshire, 1732, died in 1791. He wrote "An essay on the nature and method of ascertaining the specific shares of proprietors upon the inclosure of common fields;" London, 1766, 8vo., price 1s. 6d. "An enquiry into the means of preserving and improving the public roads of this kingdom;" Oxford, 1767, 8vo., price 1s. These books are not found in the libraries of the British Museum, though the writer's name is not omitted in any list of authors.

CXXIII.—TEMPLEMAN, 1766.

Peter Templeman, M.D., was the son of an eminent attorney at Dorchester, in the county of Dorset, and born in 1711. He received a university education, and studied physic both in England and on the continent. He published some professional works, and was keeper of the reading room of the British Museum, when it was established in 1753. He left it on being appointed secretary to the Society of arts, manufactures, and commerce. He died in 1769.

Templeman wrote "Practical observations on the culture of lucerne, turnips, burnet, timothy grass, and fowl meadow grass;" London, 1766, 8vo. The *Bibliotheca Britannica* and Weston make this statement; Loudon does not mention the name, and the libraries of the British Museum do not contain any work of that title, by the writer of that name.

CXXIV.—WALL, 1766.

Richard Wall wrote "A dissertation on breeding horses upon philosophical principles;" London, 1766, 8vo., price 2s. 6d. The *Bibliotheca Britannica* and Weston have used the name and title, but neither is found in any other register or library.

CXXV.—WHITWORTH, 1767.

R. Whitworth, Esq., one of his majesty's justices of the peace for the county of Stafford, wrote on the highways, inland navigation, and "A scheme for the improvement of broad wheels;" London, 1767, 8vo. The above statement is made by the *Bibliotheca Britannica*, and the book is mentioned by Weston; but it does not appear in any library, or in any other list of authors.

CXXVI.—CATESBY, 1767.

Mark Catesby, Esq., F.R.S., an eminent naturalist, was born in 1679, and after spending a great part of his lifetime in America in the pursuit of his favourite science, he returned to England, and died in London, in 1749. He published several works on natural history, and Weston ascribes to him "The practical farmer, or Herefordshire husbandman;" in 12 mo., price 3s. "A plan of an experimental farm, addressed to Lord Clive;" in 8vo., price 6s. "Uniting and monopolizing farms,

proved disadvantageous to the landowners;" price 1s. 6d.

None of these books are contained in the libraries of the British Museum, in which are found the other works of Catesby; nor does the Bibliotheca Britannica mention them in the list of the author's works. Loudon does not notice Catesby at all, and the insertion of his name rests on the sole authority of Weston.

#### CXXVII.—YOUNG, 1767.

Arthur Young, F.R.S., was the descendant of a very respectable family, who had resided on their estate at Bradfield, Cowhurst, near Bury St. Edmunds, in the county of Suffolk, for more than two centuries. He was born at London in 1741. His father, the Reverend Arthur Young, rector of Bradfield, had three children, two sons and a daughter, of whom our notice was the younger son. He was educated at Lavenham, a school about six miles from Bradfield, and was entered into a merchant's counting house at Lynn when he was seventeen years of age. In this occupation he commenced to be an author by writing notices and novels. In 1763 he returned to the residence of his father, unsettled in life, and not fixed to any particular pursuit. He became the manager of his mother's farm of eighty acres, and enjoyed the income of £20 from the copyhold inheritance of his female parent. He always acknowledged that in this business much money was squandered, and that he was wholly deficient in the knowledge which is required for success. In 1765 he was married, and in 1767 undertook the management of the farm of Stamford Hall, in Essex, which contained about 300 acres of land. He may not have had sufficient capital for this farm, or a concurrence of circumstances soon induced him to give to a farmer the sum of £100 to release him from it, and on the same farm the new tenant realized a fortune. He wrote some essays while he farmed here, which were published in 1772, in one volume, 4to. He advertised for a farm, and he was drawn by the answers he received to undertake journeys which gave the materials to the "tours" that were afterwards written. He hired a farm of 100 acres in Hertfordshire, and upon it the success was not mediocre; the soil and climate were execrated, while the chief blame must have been his own. He engaged as reporter to the *Morning Post* newspaper, walked from London to his farm every Saturday evening, and returning on Monday morning, a distance of 17 miles, and worked, in his words, "as a coal heaver." At this date of 1775 he had received the sum of £3000 for his writings.

In 1784 he began the publication of "The an-

nals of agriculture;" in which he acted as editor and author—a work that was continued to the time of his blindness: it comprises 45 volumes octavo, and presents a vast store of information upon subjects of agriculture and political economy. It was favoured by the assistance of able correspondents, and received very high regards. During the progress of this work, Young travelled in England, Ireland, and France. He had always entertained a favourite idea of speculating on waste lands, and he now purchased 4,400 acres of waste in Yorkshire. But other fates occurred. The Board of Agriculture was formed in 1793, and he was appointed to the post of secretary, as he was thought to be a qualified person, from his activity, zeal, professional knowledge, and general education. Like to all ardent temperaments, Young had hailed the French revolution as the dawn of a bright prospect to the human race; but being now placed under the shade of aristocracy, he rested quietly "sub silentio," and never said a word more about revolutions. He probably thought his income was more certain than anything that might lapse during the violent whirlings of a civil turmoil. He was right.

Arthur Young continued at the board till his death; he became blind, and was afflicted with an incurable disorder. He died in 1820. The following agricultural works were published by him: "The farmers' letters to the people of England; containing the sentiments of a practical husbandman on various subjects of great importance; the present state of husbandry; the importance of timber and planting;" London, 1767, 8vo., 6s. "The farmer's letters to the landlords of Great Britain;" London, 1772, 8vo., 4s. "A six weeks' tour through the southern counties of England and Wales;" London, 1768, 8vo., price 5s.—chiefly with regard to agricultural affairs. "Treatise on the management of hogs, including experiments on the curing and fattening of them;" London, 1768, 8vo. "A six months' tour through the north of England; containing an account of the present state of agriculture, manufactures, and population in several counties of this kingdom;" illustrated with plates; London, 1770, 4 vols., 8vo., 24s. "The farmer's guide in hiring and stocking farms, with plans of farm yards, and sections of the necessary buildings;" London, 1770, 2 vols. 8vo., 10s. 6d. "Rural economy, or essays on the practical part of husbandry; designed to explain some of the most important methods of conducting farms of various kinds, including many useful hints to gentlemen farmers relative to the economical management of their business;" London, 1770, 8vo. 4s. "A course of experimental agriculture, containing an exact register of all the business

transacted during five years on near 300 acres of various soils; including a variety of experiments on the cultivation of all sorts of grain and pulse, both on the old and new method; on the management of live stock;" London, 1770, 2 volumes, 4to., 30s. "The farmer's tour through the east of England, being the register of a journey through various counties of that kingdom, to enquire into the state of agriculture, manufactures, and population;" London, 1770, 4 vols., 8vo., 24s. "Proposals to the legislature for numbering the people;" London, 1771, 8vo. "Observations on the present state of waste lands in Great Britain;" London, 1772, 8vo. "Political arithmetic, containing observations on the present state of Great Britain, and the principles of her policy in the encouragement of agriculture;" London, 1774, 8vo., 4s. "Tour in Ireland, with general observations on the estate of that kingdom, made in 1776-7-8 and 9; Dublin, 1790, 2 vols., 8vo. "An essay on the culture of cole-seed for feeding sheep and cattle;" 8vo. "Annals of agriculture and other useful arts;" published in numbers. Bury St. Edmunds, 1786 to 1804, 40 vols. 8vo. "The question of wool stated;" London, 1787, 8vo. "The example of France a warning to Britain;" London, 1793, 8vo., 2s. 6d. "Travels during the years 1787-8 and 9, undertaken more particularly with the view of ascertaining the cultivation, wealth, resources, and national prosperity of the kingdom of France;" Bury St. Edmunds, 1792, 4 vols., 32s. "General view of the agriculture of the county of Suffolk, drawn up for the Board of Agriculture;" London, 1797, 4 vols., 8vo. "An enquiry into the state of mind among the lower classes, and on the means of turning it to the welfare of the state;" London, 1794, 8vo., 1s. "General view of the agriculture of the county of Lincoln, drawn up for the Board of Agriculture;" London, 1798, 8vo., 9s. "An enquiry on the propriety of applying wastes to the maintenance and support of the poor;" London, 1801, 8vo., 2s. 6d. "The farmer's kalendar, containing the business necessary to be performed on the various kinds of farms during every month of the year;" London, 1800-1812. "Essay on manures;" London, 1804, 8vo. "General view of the agriculture of Hertfordshire, drawn up for the Board of Agriculture;" London, 1804, 8vo., 12s. "General view of the agriculture of the county of Norfolk;" London, 1804, 8vo., 8s. "General view of the agriculture of the county of Essex;" London, 1806-7, 2 vols., 8vo., 12s. "General report on enclosures;" London, 1807-8, 8vo. "General view of the agriculture of Oxfordshire;" London, 1809, 8vo., 14s. "General view of the agriculture of the county of Sussex, drawn up for the Board of Agriculture;" London, 1809, 8vo., 14s.

"Advantages which have resulted from the establishment of the Board of Agriculture;" London, 1809, 8vo., 9s. "On the husbandry of the celebrated British farmers, Messrs. Bakewell, Arbutnot, and Duckett;" London, 1811, 4to., 5s. "Inquiry into the progressive value of money, as marked by the price of agricultural produce;" London, 1812, 8vo., 2s. 6d. "An essay on manures;" "Nicholson's Journal," vols. 1S, pp. 120, 1809.

Arthur Young was a person of ardent temperament, and much vivacity of thought. His zeal, enterprize, and energy, were quite characteristic of himself, and his labour was untiring and assiduity indefatigable. He had a strong bias to calculation, which led him to a speculative policy on most points, and was much assisted by a very quick imagination. His services to agriculture were important, and the value would have been greater if he had confined himself to the sole object of agriculture, and avoided the political and party themes of which he was ever ready to be the champion and asserter. He carried this rampant feeling with him to the Board of Agriculture, by which he severed the claims of its utility, and ultimately effected its dissolution; he and its president working its ruin.

The writings of Young are very carelessly performed, and most immethodically arranged. Letters, dates, signatures, compliments, and quotations, do not convey a meaning as it should be done in a concise essay, having a beginning, a middle, and an end—stating the purpose, the doing of it, and the application of the result. He projected nothing new or original, nor devised any different scheme of agriculture in any point; but he collected a huge mass of miscellaneous information, which had no small effect on the progress of agriculture. His ideas do not seem to have been very practically clear on any point. The vision was too hastily decisive, and the prospect dimmed by some crochety opinion. It cannot be denied but that he reflected lustre on the age and country in which he lived, and that he filled a large space in the public eye for a long series of years. He was much esteemed abroad, and had many presents sent him from the occupants of thrones, and pupils came to him from various nations to be instructed by his precept and example. In the private relations of life he has never been impeached—his individual worth has met no accusation, and his moral integrity has never been assailed. The strays of temperament are not very hurtful, and the times in which he lived must be charged with the political crochets of Young. His services sink the quibbles of party beneath an overwhelming load of the most meritorious deservings.

## REPORT ON THE BEST MODES OF HOUSING, AND ON SOILING AND PASTURING CATTLE.

BY MR. ANDREW TEMPLETON, CLANDEBOYE, HOLYWOOD, IRELAND.

(Premium—The Gold Medal.)

On the 24th April, 1851, I purchased eighteen pure-bred Galloway cattle, three years old, which had been bred and kept by the same farmer, in Ayrshire, on high mountain land, from the time they were one year old, and had not been housed, nor got any artificial food, with the exception of a little coarse hay in winter. When they arrived here, I put them into a bare pasture field, and gave them turnips and straw, which, in the course of a few days, they eat readily. They were continued on these till the 17th May, when they were brought into the straw-yard, and fed upon Italian grass, and where they learned to eat linseed-cake and grain.

Having resolved to test the comparative merits of the hammel or box with small yard, and the stall; and of soiling and of pasturing, in fattening cattle; and whether a small quantity of linseed-cake consumed by them would be profitable or not, I had, on the 5th of June, the cattle divided and weighed into six as equal lots of three each as I could select them, two bullocks and one heifer in each lot (the heifers being spayed), and all apparently in the same state of health and growth, having been previously kept and fed alike. The lots were housed, and treated as follows:—

Lot 1, in hammels or boxes with a small yard, with 3 lb. of linseed-cake each per day.

Lot 2, in ditto, with no cake allowed them.

Lot 3, in stalls, with 3 lb. linseed-cake each per day.

Lot 4, in ditto, with no cake allowed them.

Lot 5, on pasture, with 3 lb. linseed-cake each per day.

Lot 6, on ditto, with no cake allowed them.

Having a plentiful supply of grass during the summer, and having everything done under my own eye, the utmost care was taken that the quantities of food given should be alike, and at regular intervals, and the weights exactly ascertained at the respective dates specified.

The stalls were 7 feet in width, and to contain two cattle each. The feeding-trough of each stall was supplied with food from a passage in front, of 4 feet in breadth. Behind each stall was a gutter to receive the dung and urine from the animals.

The hammels or boxes were three in number, to contain three cattle each. They were about 12 feet square, and roofed over, having a feeding-trough along the inner back wall. The open court-yards were also about 12 feet square each, and each had a feeding trough of 7 feet in length in it, with a gate of entrance in front.

TABLE I.—*Showing the weight of eighteen Galloway cattle, when put up to feed, 5th June, 1851.*

Weight of Lot 1, which was put into hammels, and each animal had 3 lb. of linseed-cake per day.

	cwt.	qrs.	lb.
No. 1.....	10	0	0
„ 2.....	8	1	14
„ 3.....	7	2	14
	26	0	0

Weight of Lot 2, which was put into hammels, with no cake allowed them.

	cwt.	qrs.	lb.
No. 1.....	9	2	0
„ 2.....	8	0	0
„ 3.....	8	0	0
	25	2	0

Weight of Lot 3, which was put into stalls, and each animal had 3 lb. of linseed-cake per day.

	cwt.	qrs.	lb.
No. 1.....	10	0	0
„ 2.....	9	0	0
„ 3.....	7	3	0
	26	3	0

Weight of Lot 4, which was put into stalls, with no cake allowed them.

	cwt.	qrs.	lb.
No. 1.....	9	0	0
„ 2.....	8	0	0
„ 3.....	7	2	0
	24	2	0

Weight of Lot 5, which was put on pasture, and each animal had 3 lb. linseed-cake per day.

	cwt.	qrs.	lb.
No. 1.....	8	2	0
„ 2.....	8	1	21
„ 3.....	7	2	7
	24	2	0

Weight of Lot 6, which was put on pasture, with no cake allowed them.

	cwt.	qrs.	lb.
No. 1.....	9	0	7
„ 2.....	8	0	14
„ 3.....	6	3	7
	24	0	0

TABLE II.—*5th July, 1851.*

Lot 1 increased 2 cwt. in the course of the month in the hammels, each animal being fed with 3 lb. of cake per day, making the quantity 270 lb., and the cost, at three farthings the lb., 16s. 10½d., along with vetches and Italian ryegrass.

	cwt.	qrs.	lb.
No. 1.....	10	3	0
„ 2.....	9	0	0
„ 3.....	8	1	0
	28	0	0

Lot 2 increased 1 cwt. 3 qrs. 21 lb. during the month in the hammels, having been fed on vetches and Italian ryegrass, with no cake. (These two lots in the *hammels* increased in weight, during the course of the month, 3 cwt. 3 qrs. 21 lb.)

	cwt. qrs. lb.	
No. 1.....	10	1 7
„ 2.....	8	3 14
„ 3.....	8	1 0
	27	1 21

Lot 3 increased 1 cwt. 2 qrs. in the course of the month in stalls, with 3 lb. of cake to each animal per day, making the quantity 270 lb., and the cost, at three farthings the lb., 16s. 10½d. They had vetches and Italian ryegrass besides.

	cwt. qrs. lb.	
No. 1.....	10	3 0
„ 2.....	9	0 14
„ 3.....	8	1 14
	28	1 0

Lot 4 increased 1 cwt. 2 qrs. in the month in the stalls, on vetches and Italian ryegrass, without cake. (The two lots in the *stalls* increased in weight, in the course of the month, 3 cwt.)

	cwt. qrs. lb.	
No. 1.....	9	1 0
„ 2.....	8	2 0
„ 3.....	8	1 0
	26	0 0

Lot 5 increased 2 cwt. in the course of the month, on pasture, with 3 lb. of cake to each animal per day, making the quantity 270 lb., which, at three farthings the lb., gives a cost of 16s. 10½d.

	cwt. qrs. lb.	
No. 1.....	9	1 0
„ 2.....	9	1 0
„ 3.....	8	0 0
	26	2 0

Lot 6 increased only 2 qrs. in the month, on pasture, without cake. (The two lots on *pasture* increased, in the course of the month, 2 cwt. 2 qrs.)

	cwt. qrs. lb.	
No. 1.....	9	2 0
„ 2.....	8	2 0
„ 3.....	6	2 0
	24	2 0

The cattle in the first four lots of this table received three feeds of Italian ryegrass and one feed of winter tares every day, each lot receiving the same quantities. The lots on pasture were in different fields, but the grass was equally good in quantity and quality.

In seems unnecessary to continue such details for each month to the 5th of February, 1852;\* suffice it to state the particular circumstances observable in each month. In July the elements of feeding were precisely the same as in June. The

grass and vetches were not so good as in June, and the cattle in the hammels and stalls, in consequence, did not improve so much as in that month. Those on pasture had good grass.

In August, the cattle in the hammels and stalls were fed on Italian ryegrass and clover, instead of winter vetches. The Italian ryegrass was given in three feeds a-day, and the clover one feed, both being very succulent and good. The cattle in the hammels and stalls, as well as on the pasture, had 279 lb. of cake to each lot, which enhanced the cost to 17s. 5½d. The pastures were good, and the cattle made more improvement than in any other of the months.

In September, the cattle in the hammels and stalls were fed on Italian ryegrass; but neither it nor the pasture was so good as in August, and the cattle, in consequence, did not make so much improvement. The quantity of cake given to each lot was 270 lb., which reduced the cost again to 16s. 10½d.

In October, the cattle in the hammels and stalls were fed with two feeds of grass and one of yellow turnips and hay every day. Both the grass and pasture being deficient, the cattle made no improvement, except those in the hammels, of which one lot gained 2 cwt. 2 qrs. 21 lb., and the other 1 qr., in the course of the month. The quantity of cake given to each lot was 279 lb., and the cost was again enhanced to 17s. 5½d. On the 5th of November, the cattle on pasture in Lot 5 were put beside those in the hammels in Lots 1 and 2, while those of Lot 6 were put into stalls beside Lots 3 and 4. The cattle now received the same kind and amount of turnips.

In November, the cattle in both hammels and stalls had each 84 lb. of yellow turnips, and 14 lb. of hay, at three feeds. No. 2 of Lot 6, in the stalls, lost 28 lb. in the course of this month, and made no improvement during the experiment, which caused a great drawback in this lot. No reason could be assigned for this state of the animal, as it seemed as healthy as its companions. Each lot had 270 lb. of cake, at a cost of 16s. 10½d.

In December, all the cattle received 84 lb. of Swedish turnips, and 14 lb. of hay, at three feeds. The improvement of the cattle on the Swedish turnip was very strikingly exemplified over that on the yellow turnip. The quantity of cake consumed by each lot was 279 lb., at a cost of 17s. 5½d.

In January, 1852, all the cattle were fed in the same manner as in the preceding month, both as regards turnip, hay, and cake. The improvement in the condition of the cattle in the course of the month was very manifest, and would have been as great as in August, had it not been for the stationary state of No. 2 in Lot 6, as already referred to.

The following table exhibits the particulars of each lot of cattle, and of each animal, from the 5th of June, 1851, to the 5th of February, 1852, giving the increase of each animal for the eight months, and the increase of each lot for the same time, together with the qualities and cost of the cake consumed, as also the difference of increase in the different modes of treatment, and these between the three lots that had cake, and those which had none:—

\* It is but justice to Mr. Templeton to state that he furnished tabular statements containing as minute particulars as the above for every month, to the 5th of February, 1852.—EDITOR.

TABLE III.

Lots.	Nos.	How fed.	Weight on 5th June.	Weight on 5th July.	Weight on 5th August.	Weight on 5th Sept.	Weight on 5th October.	Weight on 5th Nov.	Weight on 5th Dec.	Weight on 5th January.	Weight on 5th Feb.	Increase of each animal for 8 months.	Increase of each lot.	Quantity of cake used by each lot.	Price of cake used by each lot.
			cwt. qr. lb.	cwt. qr. lb.	cwt. qr. lb.	cwt. qr. lb.	cwt. qr. lb.	cwt. qr. lb.	cwt. qr. lb.	cwt. qr. lb.	cwt. qr. lb.	cwt. qr. lb.	cwt. qr. lb.	cwt. qr. lb.	cwt. qr. lb.
Lot 1	1	Fed in hammels, and had 4 lb. cake per day.	10 0 0	10 3 0	11 2 0	11 3 0	12 0 12	12 0 14	12 3 7	12 3 7	12 0 14	2 0 0	4 2 0	0 19 2	6 17 9 <sup>3</sup>
	2		8 1 14	9 0 9	10 0 10	11 3 7	11 3 14	12 0 3	12 0 3	12 0 3	12 0 3	2 14	3 2 14	0 19 2	
	3		7 2 14	8 1 0	8 2 0	9 1 0	9 2 0	9 2 7	10 0 10	10 3 0	10 3 0	1 1	3 0 14	1 0 19	
Lot 2	1	Fed in hammels, without cake.	9 2 0	10 1 7	10 3 0	11 2 0	11 3 0	11 2 0	12 0 12	12 0 12	12 0 13	2 0 0	4 0 0		
	2		8 0 0	8 3 14	8 3 14	9 2 7	9 3 0	9 3 0	9 3 0	9 3 0	10 1 14	11 0 0	3 0 0		
	3		8 0 0	8 1 0	8 3 0	9 2 0	9 1 0	9 3 0	9 3 0	9 3 0	10 0 10	2 0 2	2 0 2	0 9 2	
Lot 3	1	Fed in stalls, and had 9 lb. cake per day.	10 0 0	10 3 0	11 2 0	12 0 10	12 0 11	12 14 12	12 0 12	12 0 12	12 0 13	0 3 0	3 0 0		6 17 9 <sup>3</sup>
	2		9 0 0	9 0 14	9 2 7	10 0 10	10 1 0	10 2 10	10 2 0	10 2 0	11 1 0	12 0 0	3 0 0		
	3		7 3 0	8 1 14	8 1 14	9 2 0	9 3 0	9 2 0	9 3 0	9 3 14	10 2 11	10 0 3	1 0 3	0 9 1	
Lot 4	1	Fed in stalls, without cake.	9 0 0	9 1 0	9 2 0	9 3 0	10 0 0	10 0 0	10 0 0	10 0 0	10 2 0	11 0 0	2 1 0		
	2		8 0 0	8 2 0	8 2 0	9 0 9	1 0 9	0 9 0	9 0 14	9 3 0	10 2 0	2 0 2	2 0 2		
	3		7 2 0	8 1 0	8 1 0	8 2 0	8 2 0	8 2 14	8 2 14	9 1 0	10 1 0	2 3 0	7 2 0		
Lot 5	1	Fed on pasture, and in hammels, and had 9 lb. cake per day.	8 2 0	9 1 0	10 1 0	10 2 0	10 3 0	10 3 0	11 0 0	11 0 0	12 0 0	3 2 0	3 2 0		6 17 9 <sup>3</sup>
	2		8 1 21	9 1 0	9 3 0	10 2 0	10 2 0	10 2 7	10 3 7	12 0 0	3 2 7	3 2 7	10 2		
	3		7 2 7	8 0 0	8 1 0	9 2 0	9 3 0	9 3 0	10 0 10	10 2 0	11 0 0	3 1 21	10 2	0 19 2	
Lot 6	1	Fed on pasture, and in stalls, without cake.	9 0 7	9 2 0	10 0 10	10 3 0	11 0 0	11 1 0	11 0 10	11 0 10	12 0 11	2 0 2	2 1 21		7 20 13 5 <sup>4</sup>
	2		8 0 14	8 2 0	8 3 0	9 1 0	9 1 0	9 0 0	9 0 0	9 0 0	9 0 0	0 3 14	0 3 14		
	3		6 3 7	6 2 0	7 1 0	8 0 0	8 0 0	8 0 14	8 0 14	9 1 0	9 1 0	2 1 21	5 3	0 50 0	

## ABSTRACT.

Lots 1 and 2, in the hammels, gained in eight months	cwt. qr. lb.	20 3 0
Lots 3 and 4, in the stalls, gained in eight months	.....	16 3 0
Lots 5 and 6, on pasture, and afterwards in hammels and stalls, gained in eight months	.....	16 1 0
The nine cattle that had cake, gained in eight months	.....	31 0 0
The nine that had no cake, gained in eight months	.....	22 3 0
Making in favour of cake	.....	8 1 0

TABLE IV.

Lots.	Nos.	Live weight of each animal.		Live weight of each animal.		Date when the cattle were slaughtered.		Live weight of each animal.		Live weight of each animal.		Live weight of each animal.		Live weight of each animal.		Live weight of each animal.		Live weight of each animal.		Butcher's remarks on the quality of the beef.					
		cwt. qr. lb.	lb.	cwt. qr. lb.	lb.	February.	March.	cwt. qr. lb.	lb.	cwt. qr. lb.	lb.	February.	March.	cwt. qr. lb.	lb.	cwt. qr. lb.	lb.	cwt. qr. lb.	lb.	cwt. qr. lb.	lb.				
Lot 1	1	10	0	0	12	0	14	2	0	March 1,	1852	14	1	0	237	213	242	213	8	0	1	105	105	Prime quality of beef.	
		8	1	14	11	3	7	12	0	0	"	"	12	2	0	191	177	191	177	6	2	20	82	93	Do. do.
		7	2	14	9	2	0	10	3	0	"	"	11	0	0	163	152	163	152	5	2	20	102	289	Do. do.
Lot 2	1	9	2	0	11	2	0	13	2	0	March 15,	1852	13	3	0	200	188	214	185	7	0	12	75	96	Good beef, but rather light coloured.
		8	0	0	9	3	0	11	0	0	"	"	10	3	0	477	446	477	446	5	2	24	57	76	Do. do.
		8	0	0	9	3	0	10	2	0	"	"	11	0	0	155	156	153	152	5	2	0	115	247	Do. do.
Lot 3	1	10	0	0	11	3	14	13	0	0	April 5,	1852	14	2	0	236	212	230	210	7	3	20	118	89	Prime quality of beef.
		9	0	0	10	2	0	12	0	0	"	"	13	0	0	196	177	196	177	6	2	6	102	78	Do. do.
		7	3	0	9	2	0	11	0	0	"	"	11	2	0	184	171	184	171	6	1	20	95	71	Do. do.
Lot 4	1	9	0	0	10	0	0	11	1	0	April 12,	1852	12	0	0	184	166	180	167	6	0	25	84	67	Prime quality of beef.
		8	0	0	9	0	0	10	2	0	"	"	11	0	21	165	151	171	147	5	2	18	117	67	Do. do.
		7	2	0	8	2	14	10	1	0	"	"	11	1	0	154	153	153	146	5	1	18	118	77	Do. do.
Lot 5	1	8	2	0	10	3	0	12	0	0	March 22,	1852	12	0	0	195	178	196	169	6	2	10	103	73	Good beef, but rather high coloured.
		8	1	2	10	2	0	12	0	0	"	"	12	0	0	190	182	185	173	6	2	2	93	84	Do. do.
		7	2	7	9	3	0	11	0	0	"	"	11	2	0	160	162	157	165	5	3	0	131	57	Do. do.
Lot 6	1	9	0	7	11	1	0	11	2	0	March 30,	1852	11	2	0	188	174	191	171	6	1	24	101	83	Prime quality of beef.
		8	0	14	9	0	0	9	0	0	"	"	9	3	0	148	148	150	140	5	0	26	88	70	Do. do.
		6	3	7	8	0	14	9	1	0	"	"	9	3	0	144	141	144	136	5	0	7	73	61	Do. do.

TABLE V.

Lots.	Nos.	How fed.	Weight on 5th June.		Weight on 5th July.		Weight on 5th August.		Weight on 5th Sept.		Weight on 6th October.		Weight on 5th Nov.		Weight on 5th Dec.		Weight on 5th January.		Weight on 5th Feb.		Increase of each animal.		Increase of each lot.													
			cwt.	qr.	lb.	cwt.	qr.	lb.	cwt.	qr.	lb.	cwt.	qr.	lb.	cwt.	qr.	lb.	cwt.	qr.	lb.	cwt.	qr.	lb.	cwt.	qr.	lb.	cwt.	qr.	lb.							
Lot 1	1	} Feb in hammels, with 9 lb. cake per day.	8	3	0	9	1	7	9	3	0	10	1	14	10	3	0	11	3	0	12	1	0	3	2	0	0	0								
	2		7	3	0	8	2	0	9	2	0	10	0	10	1	14	10	2	0	11	0	0	1	7	12	0	4	1	0							
	3		7	1	0	7	3	7	8	2	7	9	3	0	10	1	0	10	2	0	10	0	2	1	1	14	4	0	14	11	3	14				
Lot 2	1	} Feb in stalls, with 9 lb. cake per day.	8	3	7	9	2	0	9	2	0	10	0	7	10	0	11	0	11	1	0	11	1	0	11	1	0	2	1	21	0	0				
	2		7	1	4	7	2	14	8	0	9	0	9	3	0	9	2	0	9	3	0	10	0	10	2	0	3	0	14	0	14	0	14			
	3		6	2	7	0	7	0	7	1	6	8	1	7	8	3	0	9	0	9	0	9	1	0	9	3	14	3	1	14	8	3	21			
Lot 3	1	} Fed on pasture and in hammels, with 9 lb. cake per day.	6	2	14	6	3	14	7	1	0	8	2	0	9	0	0	8	3	0	9	0	14	9	2	0	10	2	0	3	3	14	0	0		
	2		6	2	7	6	3	0	7	1	0	8	1	0	8	2	0	8	2	0	8	2	0	8	2	0	9	0	0	3	0	10	0	3	1	21
	3		6	0	0	6	1	0	6	2	0	7	2	0	7	2	0	8	1	0	8	1	0	8	1	0	8	3	14	9	1	0	10	2	7	

Table IV. gives details embracing the results of the previous experiments, in the form of the beef and fat yielded by each animal on being slaughtered. The cattle were sold to Mr. Thomas Gaffikin, flesher, Corn Market, Belfast, in February, one lot to be taken away every week, commencing on the

1st of March, 1852, on the understanding that an accurate account of the beef of each quarter, and of the fat and hide of each animal, should be kept and reported. Mr. Gaffikin having a large supply of cattle from Scotland in the second week of March, it was inconvenient for him to uplift any of the lots under experiment in that week, but ever after that period he uplifted them according to agreement.

It will be observed from the table that Lot 1 was first slaughtered; Lot 2, second; Lot 5, third; Lot 6, fourth; Lot 3, fifth; and Lot 4, sixth—making a difference of six weeks and one day between Lot 1 and Lot 4, which would have made a difference on the average increase of Lot 1 of fully 2 cwt.

In each of the lots the heifers were No. 3; and it will be observed from the table, that, although they were lighter than the bullocks, they produced more fat. Also, that Lot 4, which had no cake, had more fat than Lot 3, which had cake, but it had not either so much beef or hide as Lot 3. Again, Lot 5, which had cake, had more fat than any of the lots, although considerably less beef than either Lot 1 or Lot 3. Lots 1 and 2 had heavier hides than any of the others.

At the commencement of the experiment I selected nine one-year-old cattle, a cross from the Ayrshire cow and short-horned bull, which were bred on this farm, and divided them into three lots, which were put up to feed as follows:—

Lot 1, in hammels.

Lot 2, in stalls.

Lot 3, on pasture.

They had a good supply of grass, and 3 lb. of linseed-cake each per day. They were weighed monthly, from the 5th June, 1851, to the 5th February, 1852, when they were sold. But their dead weights could not be ascertained, as part of them went to the Liverpool market. Lot 3 was first on pasture, and then put into hammels on 5th November.

Table V. shows the live weight from June to February.

In concluding my remarks upon the different modes of treating cattle, which have been adopted here, I may observe that the cattle in all cases made the greatest improvement in the hammels, and that the lots which had 3 lb. linseed-cake each per day made a fair return for the value of cake consumed. The cost of erecting hammels and byres for stall-feeding will be nearly the same, unless at farm steadings, where there are walls against which can be placed sheds, as has been done here, and which makes the cost of hammels about one-third less than that of houses for stall-feeding. The cattle in hammels use a third more litter than those in stalls, but a third less attendance suffices for the cattle accommodated within them than in stalls. Hence, as far as my experience has gone, it is decidedly in favour of the small hammel, or the box with a small yard, as it may be named, with a small quantity of cake, as the best accommodation for feeding cattle. I have, accordingly, adopted it to a considerable extent, in preference to any other plan.—Journal of Agriculture, and Transactions of the Highland and Agricultural Society of Scotland, Jan., 1853.



## ARTERIAL DRAINAGE.

One good will result from the present long-continued deluge of rain—like that which closed the last century, it will stimulate the least energetic among farmers and landowners to drain their lands. The extensive and rich alluvial tracts on the banks of our principal rivers, which have now been inundated for nearly two months in a manner that must prove injurious to the crops for several years, will enforce with greater urgency than any other argument the necessity of improving the present defective arterial drainage of many important districts. It is impossible to have travelled of late along the valleys of the Thames, the Severn, and the Trent—to say nothing of rivers of less note—without having been struck with this fact, and without being convinced that works of arterial drainage are an essential preliminary to the effective furrow-draining of those lands which are but little elevated above the floods. As the drainage of the uplands proceeds, the importance of improving the main lines of watercourse will become more urgent. The health of the population, no less than the productiveness of the soil, is suffering from the want of it. From various quarters we hear of the prevalence of typhus fever in rural districts; and the malady will increase with the first warmth of spring and the exhalations which it will cause from the saturated land.

For the effectual remedying of the evil, it will be necessary that two impediments should be removed. Old commissions of drainage will, in many cases, require to be remodelled, and powers to remove mill-dams and other obstructions of that nature, and to compensate the owners for their removal, must be given to the new commissions. Such obstructions are often more injurious to the adjoining lands than natural impediments in the river channels; and the damage which they cause to the land is, in many instances, greater than the benefit which they confer on their owners.

It is common to see these water mills accompanied by the tall chimney of a steam-engine, to be used during that not inconsiderable portion of the year when the operations of the water-wheel must be suspended without such aid, in consequence either of floods or of drought; there are, moreover, many cases in which steam, as the most economical motive power, might wholly supersede water.

Many Commissions of Drainage will require

to be remodelled, both as regards their constitution and their jurisdiction. With respect to jurisdiction, it is essential that its bounds should be not territorial but natural; not limited to hundreds or counties, but co-extensive with the whole catchment basin drained by a river and its tributaries, over whatever counties or parts of counties it may extend. Along the valleys of our principal rivers there are many separate Boards of Drainage, all working at a disadvantage, if they work at all, because they work without any combined system of operations. The proprietors near the head waters lay their own lands dry at the expense of those immediately below them. These cannot relieve themselves of the additional waters poured down upon them, because they have no command over the outfall, which is under the jurisdiction of other commissioners, who regard—and with their present limited powers, very properly regard—only the immediate interests of the locality under their special care. These local boards not only are without the power of systematic action, but they are encumbered with the expense of more than one staff where one would suffice. Their local establishments, generally inefficient, cost more than the sum which would command the best professional services for a large district.

The success which has attended the consolidation of the local road trusts round London is a strong argument in favour of the consolidation of the separate and independent Commissions of Sewers at present existing within one natural area of drainage. Their composition closely resembles that of the old and inefficient road trusts; and it is not surprising that the same kind of tree should bear the same kind of fruits. The principal landowners of the district are nominally members, but, in reality, take little or no part in the proceedings. There is a host of the small gentry and of clergy among the commissioners, qualified for the sake of the position in society which the office is supposed to indicate, and for the social parties which close the meetings for business—or *quasi* business. Among a body so constituted a knowledge of the principles of engineering, and competence to judge of the merits of any plan of improvement laid before them, is not to be expected. Such knowledge is not expected in the officers who have charge of the works. It would even be held a disqualification, as being theoretical; and the preference would be given to

some body, who veiled his ignorance under the name of being "practical;" and whose greatest recommendation would be that the salary was an object to him, and that he had sufficient interest to command a majority of votes. All power is virtually in the hands of the clerk and of a noisy clique, who bear down all attempts at administrative reform and improvement of the drainage. Rates sufficient to pay the salary of the clerk are passed without opposition; but a plan for strengthening the embankments, or widening and deepening the main channels and enlarging the outfalls, if brought forward, is resisted, *on the plea of economy, as a job*. Such plans, which are usually distasteful to the governing powers of the commission, are kept back to the close of the meeting. Any motion brought forward then is sure to be postponed. Those who come only to *dine* are anxious for their dinners: and even the eloquence of Burke was lost on his hearers when he "thought of convincing while they thought of dining." The most business-like, active, and energetic, are disgusted and wearied with the perpetual disputes raised on every question even of mere routine, by the impracticables abounding in a body on which the owner of two or three acres has an equal voice with the proprietor whose stake is the greatest in the lands liable to be rated. In addition to these constitutional impediments to the proper discharge of their functions, some commissions are clogged with the provision that a verdict by a jury in favour of any new work shall be had before any plan for its execution can be entertained by the commissioners. Such are the evils of most of our present Commissions of Drainage. How they may best be remedied—how combined, systematic and efficient action may be secured, without the introduction of too much of centralization—is an important question, the discussion of which must be postponed to a future opportunity.

In treating of the disadvantages under which our present Commissions of rural drainage labour, we adverted to the want of knowledge on the part of their officers of the commonest principles of engineering, on which the success of the works depend which are entrusted to their care. We adverted also to the incompetence of the majority of the commissioners to form a judgment on plans laid before them, which it is their business to sanction or to reject. When the means of a scientific and industrial education shall be placed within the reach of the agricultural class, and when they shall have availed themselves of the advantages which it will offer, commissions of drainage constituted as at present will work better than they do. Their failure

arises from their being constituted on the erroneous principle that men possess intuitively the knowledge necessary for the proper performance of certain duties, which knowledge is only to be obtained by study, and is studied at present only by a few, in order to qualify themselves for a special profession. With the diffusion of education in applied science a larger proportion of efficient commissioners will be found among any ten men taken at hazard, and a greater amount of professional knowledge will be possessed by the lower grades of professional men. This, however, will be the work of time. One generation must, and probably several will pass away before this desirable state of things can be attained. In the meantime our local boards require to be rendered subject to some central control, exercised by men of science, who have had practical experience in its application.

Many of our readers are, we have no doubt, at present engaged in draining their own lands, or are exercising (under a system of municipal self-government) functions, the well or ill discharge of which affects the interests of others as well as themselves. They are acting without any knowledge of the principles on which the works which they direct should be conducted; and they are acting by means of officers whose knowledge of the subject is often no greater than their own. For the benefit of such readers we offer a few remarks on the fundamental principles of arterial drainage and embanking. We offer them not with the presumptuous expectation of being able to communicate the necessary amount of knowledge, but with the hope of awakening some to a sense of their deficiency, and of stimulating others to correct it by self-education, and to supply it in the meantime by calling in the aid of the best professional assistance.

Rivers are the ultimate or main channels by which the surplus waters of every district are conveyed to the sea. They are the arteries in which the minor veins unite; hence the regulation of rivers as water-courses is called arterial drainage. Its execution requires a knowledge of the action of rivers, and of the motion of fluids in general, or of hydraulics. The whole area of which any river is the main drain is called the catchment basin of the river. The catchment basin of every large river is made up of a number of minor basins, through which the fall of the ground, or the gradients of the river, vary considerably. The fall, usually stated in the number of feet to the mile, is generally greatest in the upper portions, and diminishes to nearly a dead level as the sea is approached. Where the fall of the ground, and consequently the velocity of the current, is the greatest, a smaller channel will suffice to convey a given volume of water than on a more level tract. With the addi-

tion of each successive tributary the volume of water is increased, and with the increased volume an addition is made to the velocity of the entire mass; hence, by one of the beautifully simple provisions of Nature, rivers are furnished with the power of enlarging their channel when they require it, from entering the tracts near the sea, where the fall diminishes. The increased velocity arising from increased bulk causes increased action on the bottom and sides, by which the channel is widened and deepened, unless in those cases in which such increased action is prevented by the hardness of the bed or the tenacity of the soil. To remove these impediments, and to assist Nature in her operation, constitutes the art of arterial drainage; and if we would work successfully, we must work in accordance with the laws of Nature, and copy her mode of working.

In determining the extent to which the dimensions of a river require to be enlarged, in order to prevent the adjoining lands from being flooded, and in order to allow of their being furrow-drained to the most advantageous depth, when the nature of the soil is such as to require that it should be furrow-drained, we must first ascertain the area of the catchment basin of each part of the river, the quantity of rain which falls on it in a given time, and the proportion of that rain-fall which enters the rivers in that time, during periods of the greatest floods. We have then to ascertain the dimensions of channel required to carry it off. And first, with regard to catchment basins. For determining their area accurate maps are required, exhibiting the physical features of the country. The Ordnance maps, on the scale of one inch to the mile, are the best public maps which we at present possess for the purpose in England. In Ireland they have Ordnance maps on the scale of six inches to the mile; but here every commission of drainage requires a special map of its district, with the contours or levels accurately defined, and on a sufficiently large scale. From these we can calculate the number of acres or square miles whose surplus waters are discharged into a river or portion of a river or tributary. Commencing at the source, we have first to determine the catchment-basin of the river, till the junction of its first tributary—that is to say, the area around it which it unwaters, up to the ridges or watersheds of the surrounding high grounds. To this must be added, at the junction of the next tributary, the area of its basin; and so on through the whole course of the river. The number of acres or of square miles in a catchment-basin having been thus found, the next step is to ascertain the number of cubic feet per minute which it may be expected to yield during the times

of greatest flood. Assuming half an inch in depth as the maximum discharge into the river in twenty-four hours—the reason for which will be stated hereafter—we have 1815 cubic feet upon each acre. This multiplied by the number of acres in the catchment-basin (if the area is calculated in acres), and the product divided by 1440 (the minutes in twenty-four hours), will give the discharge per minute, which must be provided for. As a more expeditious process, sufficiently accurate for practice, the area in acres increased by one-fourth will give the discharge per minute in cubic feet. If, on the other hand, the area of the catchment-basin be given in square miles, the amount multiplied by 807, or, for simplicity, by 800, which is quite correct enough for practice, will give the number of cubic feet of discharge per minute, on the assumption that half an inch is the greatest proportion of the rainfall which enters the river in twenty-four hours. If from the circumstances of the locality a greater or smaller depth is expected, the corresponding discharge per minute in cubic feet may be found by a simple question in proportion, or by inspection of tables which have been calculated for that purpose.

In former articles on arterial drainage the method of calculating the discharge per minute in cubic feet from the catchment basin of the river, or the area to be drained, was explained. We will now endeavour to show how the dimensions of channel capable of accommodating that discharge are determined. The quantity of water which a channel will discharge in a given time depends upon its sectional area, and the mean velocity of the current. It will be necessary here to explain these and other technical terms.

The *sectional area* of a river or conduit consists of the number of square feet or inches contained in a vertical section at right angles to the stream.

The velocity of a river, or the rate at which it flows, varies in different parts. It is greatest on the surface and in the middle of the stream, and least at the bottom and on the sides, where it is retarded by their friction. The *mean velocity* is the half of the sum of velocities at the surface and at the bottom. The determination of the mean velocity of a stream is a point of the utmost importance, because upon the product of that, and the sectional area of the channel, depends, as we have said, the discharge or *expense* which it is capable of effecting. Its particular place in the stream cannot however be ascertained, because it varies with the velocity. In moderate velocities it is more than one-fourth of the depth from the bottom; in very great velocities it is much higher, but never in the middle of the depth. The superficial velocity, however, is easily determined by observation. We have only to note

the distance which a float, in the middle of the stream, is carried in a given time. From this velocity of the surface the bottom and mean velocities may be obtained by calculation. The rule, divested of its algebraic dress, may be thus stated in words. Take unity from the square root of the superficial velocity, and the square of the remainder will be the velocity at the bottom. The mean velocity is the half of the sum of these two velocities.

It is of great importance to know the bottom velocity, because upon that and the kind of soil depends the stability of the bed. No bed is more durable than one of very fine clay, if the bottom velocity is less than fifteen feet per minute. It has been ascertained that a bottom velocity of fifteen feet per minute will just begin to tear up very fine clay—

30 feet per minute will remove fine sand ;

40 feet, sand as coarse as linseed ;

60 feet, fine gravel.

120 feet, round pebbles of an inch diameter.

180 feet, angular stones of two inches diameter.

Other terms in hydraulic engineering which require explanation are the following :—

The *border* of a river is that portion of the bottom and sides which are in contact with the water.

The *hydraulic mean depth* is the depth which the river would occupy in a channel, having vertical sides and a flat bottom, of equal area with the natural channel.

The form of the section of river beds is trapezoidal ; the slope of the sides generally one to one—that is, one foot horizontal to one of depth. These, however, are sometimes found too steep to be permanent, and in the upper portions of rivers and in the steeper grounds a slope of 4 to 3 is frequently adopted, being a slope common in nature, and found to stand well. The sectional area, the border, the mean hydraulic depth, the fall or declivity, and the mean velocity of the current, are the elements of calculation in determining the quantity of water which a channel will carry off in a given time.

Supposing the sides to have a slope of one to one, the sectional area is found by multiplying the breadth of the bottom by the depth, and adding the square of the depth.

The border is found by multiplying the depth by the square root of 8, and adding the breadth of the bottom. To find the hydraulic mean depth, divide the sectional area by the border thus found. The hydraulic mean depth (see the explanation given of it above) is required for the determination of the mean velocity ; and the mean velocity is such, that if the whole stream moved with it, it would produce the same discharge as results from the compound motion of its parts. To calculate the

mean velocity, multiply the hydraulic mean depth by twice the fall in feet per mile, take the square root of the product, and multiply it by 55, or, which is the same thing, by the decimal fraction .9166 multiplied by 60, the seconds in a minute.

Lastly, the mean velocity multiplied by the sectional area gives the discharge per minute in cubic feet. The discharge may also be obtained by multiplying the sectional area by the mean velocity, deduced by calculation, in the manner previously described, from the observed surface velocity.

In the preceding calculations the sides were supposed to have a slope of one to one. There are other processes by which the discharge of channels having sides of a greater or less slope may be ascertained. By these means the quantity of water which a channel of certain dimensions, and having a given fall, is capable of discharging in a specified time, is found. Converse processes give the dimensions of channel which are necessary to provide for a given quantity of water. These calculations are tedious and laborious ; and therefore, to save time and trouble, tables constructed from them are generally used in practice. Many useful tables of this kind, and others, for ascertaining the water power of a stream, and the cubic contents of earth work, will be found in a little work on hydraulic engineering, by John Dwyer, C.E., engaged in the Drainage Department of the Board of Works in Ireland ; a work which has been already noticed in our paper. The author describes it as designed for the use of engineers, mill-owners, land surveyors, and inspectors of drainage. We would conclude by strongly recommending the study of it to Commissioners of Drainage—not without great doubt, however, whether many will be found capable of calculating, even with the aid of these tables, whether the dimensions of channel proposed for the improvement of the drainage of their district are sufficient to carry off the water which it will receive from the area to be drained. The want of this ability frequently prevents those commissioners from forming a correct opinion, who are conscientiously desirous of doing so. An eminent engineer, for instance, will have been consulted. His plan is expensive because he gives the channel the requisite width, to carry off the quantity of water to be provided for, with such a moderate velocity as shall secure the permanence of the bed. In every district there are plenty of local geniuses, who under the name of “practical men” are supposed to understand intuitively any business that has a good remuneration attached to it. Such are ever ready to rush in where others fear to tread, and are sure of plenty of support from the members of “Saxon institutions” like our present Commissions of Drainage, which are better adapted to the times

of Alfred than to those of Victoria. One of these practical men undertakes to effect all that is required at less expense. His plan is adopted because the commissioners do not know enough of hydraulics to be able to detect its errors. The works are executed; and when a great outlay has been incurred, it is found that the channel is insufficient to carry off the surplus water of the district; or that its declivity is so great, and the slope of the

sides so small, that the steam is constantly undermining its banks, and entailing annual expense for repairs, to which the local practical man has of course no objection. Even the straightening of the bends of a river requires more study of the action of running water, and of the rocks and soils over which it flows, and more calculation, than is usually supposed, in order to render it beneficial, or to prevent it being worse than useless.

THE FALL OF RAIN IN 1852.

The year just closed has been distinguished by its heavy falls of rain, which were chiefly in January and February, then in June and August, and again in the three last months of the year. The north of England had its share of this fall in the earlier parts of the year; but in the latter period, the midland and southern parts of England seem to have had more heavy rain than has been experienced in Lancashire and Yorkshire. Before proceeding to notice the actual fall of rain during the year 1852 in various places, it may be as well, by way of data for comparison and just estimate, to cite the average or mean fall at different places, taken for greater or less periods—at the same time guarding the reader against any conclusions drawn as to average quantities, from periods shorter than 18 or 20 years. To begin with Manchester, the late Dr. Dalton recorded the fall here, monthly and yearly, during 47 years, as follows:—

Monthly and annual mean	1794-1801, 8 years.	1802-1818, 17 years.	1819-1840, 22 years.	1794-1840, 47 years.
of rain-fall.	Inches.	Inches.	Inches.	Inches.
January . . . .	2.06	2.357	2.257	2.257
February . . . .	2.26	2.631	2.373	2.444
March . . . . .	1.77	2.283	2.521	2.304
April . . . . .	2.42	1.663	2.330	2.109
May . . . . .	2.92	2.653	2.189	2.460
June . . . . .	1.76	2.417	3.244	2.691
July . . . . .	3.51	3.349	4.053	3.706
August . . . . .	3.73	3.109	3.672	3.478
September . . .	4.16	2.431	3.431	3.195
October . . . . .	3.96	3.628	3.731	3.733
November . . . .	3.14	3.490	4.089	3.710
December . . . .	2.91	3.585	3.501	3.431
Total year . . .	34.60	33.596	37.394	35.518

It will suffice for all our present purposes to regard, as the result of observations extended over 47 years (the rain-gauges being placed, we believe, in the premises of the Mayfield print-works, where they were not much influenced by buildings), that the mean annual rain-fall for that period in Manchester is about 35½ inches. But we are enabled to extend the annual mean rain-fall to the present time, by the kindness of Mr. L. Buchan, who has had a rain-gauge, free from all overshadowing building, near his residence at Ardwick, and has regularly registered the rain-fall, from the year 1825 to the present time. During the ten years from 1825 to 1834 inclusive, the yearly mean fall of rain was 35.115 inches; and in the following ten years, from 1835 to 1844 inclusive, the annual mean was 36.289 inches. Mr. Buchan also took the mean fall for each quarter of a year in both these decades as follows:—

	Mean, 1825-1834.	Mean, 1835-1844.
	Inches.	Inches.
First quarter . . .	5.880	7.865
Second quarter . .	7.847	7.090
First half . . . . .	13.727	14.955
Third quarter . . .	11.015	11.025
Fourth quarter . .	10.373	10.309
Second half . . . .	21.388	21.334
Year . . . . .	35.115	36.289

During the remaining eight years from 1845 to 1852, both inclusive, we give the actual yearly fall of rain each year:—

Year . . . . .	Inches.	Year . . . . .	Inches.
1845 . . . . .	38.35	1849 . . . . .	36.15
1846 . . . . .	31.95	1850 . . . . .	33.00
1847 . . . . .	40.30	1851 . . . . .	31.50
1848 . . . . .	41.35	1852 . . . . .	39.40

This would give the annual mean for these eight years of 36.50 inches; that for the previous 20 years 35.702 inches; and for the whole 28 years 36.10 inches.

Again, if we take Dr. Dalton's mean for 47 years, including 1840, and give each succeeding year from Mr. Buchan's rain-gauge at Ardwick, we shall then cover the whole of the period since 1794:—

Year . . . . .	Inches.	Year . . . . .	Inches.
1841 . . . . .	41.50	1843 . . . . .	39.80
1842 . . . . .	33.45	1844 . . . . .	26.05

(The years 1845 to 1852 are given above.)

The annual mean of the 12 years since Dalton is 36.60 inches at Ardwick; or assuming the whole to be a continuous series of registers for 59 years, the annual mean would be 36.05 inches.

We come next to the year just closed. The following table exhibits the monthly fall at three places in or near Manchester during each month of 1852; and also the actual fall of the whole year:—

Month.	Manchester.	Botanic Gardens.	Ardwick.
	Inches.	Inches.	Inches.
January . . . . .	5.69	5.50	5.20
February . . . . .	4.81	4.10	3.05
March . . . . .	0.63	0.70	0.60
April . . . . .	0.56	0.50	0.55
May . . . . .	1.35	1.60	1.60
June . . . . .	6.02	4.80	5.25
July . . . . .	4.17	2.70	3.00
August . . . . .	5.42	5.20	4.60
September . . . .	2.45	2.50	2.10
October . . . . .	3.79	3.50	3.60
November . . . . .	5.23	5.20	4.70
December . . . . .	5.61	4.70	5.15
The whole year . .	45.73	41.00	39.40
		4.73	6.33

The Manchester register is from Mr. Casartelli's rain-gauge, which is so remarkably above the others, that some doubt has been expressed as to its accuracy. The rain-gauge at Ardwick is that of Mr. L. Buchan, an experienced and careful observer and recorder. The gauge at the Botanic Gardens registered 4.73 inches less rain in the year 1852, than that of Mr. Casartelli; and Mr. Buchan's gauge at Ardwick registered 6.33 inches less than Mr. Casartelli's. We will next exhibit, in juxtaposition, the monthly rain-fall of 1836—the heaviest in Manchester for more than a quarter of a century—with that of each month in the last four years:—

Months.	1836.	1849.	1850.	1851.	1852.
	Inches.	Inches.	Inches.	Inches.	Inches.
January .....	3.70	4.20	4.96	3.15	5.20
February ....	2.60	2.00	2.30	1.70	3.05
March .....	3.60	0.70	0.90	3.40	0.60
April .....	2.80	1.15	2.50	0.60	0.55
May .....	0.60	2.90	1.80	1.95	1.60
June .....	4.30	2.00	5.60	5.25	5.25
July .....	5.40	5.30	2.80	3.55	3.00
August .....	1.70	2.60	3.95	2.80	4.60
September ...	4.60	4.55	2.80	1.50	2.10
October .....	3.55	3.55	3.00	3.95	3.60
November ...	6.80	4.35	3.80	1.70	4.70
December ...	3.95	4.95	2.25	1.60	5.15
Total year	43.60	36.15	33.00	31.50	39.40

In the above table we have two years below the average, one slightly, and two considerably above it. It will be seen, if we take the three last months of the year, that in that period, in 1836, the fall was 14.30 inches, and in 1852, 13.45 inches—the nearest approach to that excessive fall for some years past. The following are the only years since 1825, in which the annual fall has exceeded 40 inches at Ardwick:—

	Inches.		Inches.
1828.....	42.30	1841.....	41.50
1833.....	41.40	1847.....	40.30
1836.....	43.60	1848.....	41.35

It will be seen by the table of monthly fall in the five years named, that the greatest monthly fall of rain in the three last years was in June; in the year preceding them in July; and in 1836 in November, when nearly seven inches fell. The least monthly quantity in 1836 was in May; in 1849 and 1850 in March; and in 1851 and 1852 in April.

We will next take several places in this neighbourhood, a to the rain-fall of the year 1852:—

Place.	Fall in 1852.	Place.	Fall in 1852.
	Inches.		Inches.
Manchester (Casartelli) .....	45.73	Bowdon (Cheshire) .....	38.43
Botanic Gardens .....	41.00	Gorton Water Works. ....	37.34
Ardwick (Buchan) .....	39.40	Dukinfield .....	41.48
Manchester (Mayfield). .....	38.36		

From these figures it would seem that, taking even the lowest estimate of the year's fall in Manchester, that at Mayfield, it is 2.85 inches above Dalton's mean annual fall upon the long range of 47 years.

We derive the following table of the average yearly fall at the places named, from Professor John Phillips's recent work, "The Rivers, Mountains, and Sea Coast of Yorkshire":—

Place.	Yearly fall.	Place.	Yearly fall.
	Inches.		Inches.
Settle (north west) .....	43.0	Upleatham (Cleveland) .....	22.0
Halifax (south west) .....	33.0	York .....	24.0
Brandsby (north east) .....	28.5	Keysinghau (Holderness) .....	18.0
Huggate (south east) .....	30.0	Scarborough .....	23.0
Bolton (by Bolland) .....	47.0	Total Yorkshire .....	30.0

The annual average fall of rain on the east coast of Yorkshire is estimated as under 20 inches, on the extreme west under 50 inches.

The following exhibits (from Professor Phillips's work, already cited) the mean annual fall of rain in York and in London, for a period of 25 years—1812-1847, both inclusive:—

	York.	London.
January .....	1.7024	1.84
February .....	1.5380	1.51
March .....	1.4872	1.59
April .....	1.6848	2.04
May .....	1.9820	2.24
June .....	2.0516	2.15
July .....	2.6436	2.44
August .....	2.4388	2.17
September .....	1.7684	2.40
October .....	2.7036	2.49
November.....	1.9920	2.38
December.....	1.0000	2.39
Annual fall ...	23.8924	25.64

In which the measure for October is still the greatest, and that for March the least at York; February being rather the least in London.—Manchester Guardian, Saturday, Jan. 15, 1853.

## DISEASE IN TURNIPS.

SIR,—I observe in your paper of the 2nd of December a letter of Mr. Geo. Singer, of Dorchester, in which he attempts to account for the disease in turnips, commonly called "Fingers and Toes." The subject is one which deserves attention: it is of great and growing importance to the farming interest. If the disease continue unchecked, a considerable per-centage of the crop must be yearly lost, and the farmers' gains proportionably lessened. Though in the 21 paragraphs into which Mr. Singer divides his letter there are some valuable general observations, still I am convinced that in none of them has he accounted for the disease, or suggested a remedy. I have carefully watched the progress of the disease during the last five years, and have tried many experiments to test the effect of varieties of seed, soil, and manure upon it; and I now offer, through you to the public, the result of my observations, with the view of provoking others to do the same, that thus from the multitude of experiments, if possible, a sound con-

clusion may be arrived at, both as to the cause of the disease and the remedy.

To insure some order in these remarks, I shall, first, offer some observations on Mr. Singer's paragraph *seriatim*, and then state my own opinion of the cause of the disease.

Mr. Singer, in the 1st and 21st paragraphs of his letter, states, that he does not think that the variety of the turnip has much to do with it (the disease), except that the most rapid growing and tenderest sorts seem rather most effected.

He adds, "I have never seen *swedes hurt with it to any extent.*" Overlooking the contradiction in the above statements, where what is advanced in the one sentence is refuted in the next, I have to state that during the period over which my careful observations extend, I have seldom seen any other variety except the Swedish injured—even when growing side by side with them, and subject to the same treatment in every respect.

In the 2nd and 20th paragraphs Mr. Singer says, the soil

on which it (the disease) prevails is stiff, rather black, and deep. Here I must put myself in direct opposition to him again, as I have never seen the disease in that description of soil, but always upon a red loam with a hard retentive subsoil, or dry red soil, with gravelly bottom.

In his 3rd and 15th paragraphs, Mr. Singer states, sowing in wet weather has a very powerful effect in developing its evils. Now, all practical farmers must agree that it is most desirable to have the land in dry working order at seed-time; yet sometimes this cannot be obtained: and I am convinced that wet ploughing, hoeing, &c., has nothing to do with the disease.

Mr. Singer, in the 4th paragraph of his letter, gives us an account of his mode of manuring for turnips, which, if it succeeds, must entitle him to the £1,000 prize offered by the English Agricultural Society for a substitute for Peruvian guano. If Mr. S. can manure one acre of land for turnip with  $1\frac{1}{2}$  cwt. of superphosphate of lime and two bushels of undissolved bones, I cannot see the use of going to Peru for guano. The fertilising power of superphosphate of lime may be very great, but it would require to be greater still before the generality of the farmers in the south of Scotland could be convinced that the disease in Mr. S.'s turnips was not owing to the want of manure.

I agree with Mr. S. in what he states in paragraphs 5th and 6th, as to the time at which the disease shows itself, and as to its being partial in its ravages—affecting one end of a drill or field whilst the other may be entirely free from it—the reason, as I shall afterwards show, being the difference in the nature of the soil.

With what Mr. S. states in paragraph 7th, about insects being the effect of the disease, and not to some extent the cause, I cannot agree. *Were there no insects, there would be no fingers and toes, in my opinion.*

Neither can I agree with what he says of the preventive influence of draining, liming, and subsoiling, as I have seldom or ever seen the disease in damp land.

The remaining paragraphs of Mr. S.'s letter I must, in the meantime, pass over for want of room, and conclude by briefly stating my own opinion of the cause of the disease, leaving the public to judge to what extent I have succeeded in accounting for it.

1st. Let me describe the nature of the soil upon the farm to which my observations refer. It is of two kinds; the one a red loam, the other a grey loam; but both on the same kind of subsoil, viz., hard retentive till. The fields on the farm are so laid off as to leave four acres of red loam in the end of every field, and the remaining portion of the field grey loam. Now, I have always found the grey loam much more moist than the red; whilst on the dry red soil the turnips were almost entirely destroyed by the disease; the grey soil, retaining its dampness, was seldom if ever visited by the disease at all. Why was this? I was led to ask myself. The seed was the same, manure the same, time of sowing the same, and yet the crop was entirely destroyed on one part of the field, and on the other part unhurt.

2nd. My decided conviction is, that WIRE WORM is the cause of the disease, and that this will enable us to account for many other facts for which we have often been at a loss to assign a cause, such as the disease prevailing much in land from which clover has been lately cut, and its absence from moist soils.

The wireworm, ready for operations when the crop has been

in the soil about six weeks, seizes on the main root of the plants; some of these he cuts entirely through, and others are but wounded: this latter is most generally the case. The plants whose roots are entirely cut through die, and are carried away by the first blast. Those whose roots are but partially cut by the worm at first may be seen, when the strong noon sun beams upon them, sickly and drooping; but when the evening comes, and its invigorating dew is felt, they revive. The wounded plant in the mean time, by an effort of nature, endeavours to ward off its doom, by making up for the loss it has sustained in its wounded main root. Immediately above the place where the worm has wounded it, it sends out small tendrils. The superabundance of nourishment which its leaves derive from the atmosphere force it to do this; but these small tendrils, owing to their inability to force their way deep into the soil for that strength which the soil alone can afford them, cannot make up to the plants for the loss of the wounded main stem. The consequence is that it dies, the root being entirely eaten through, or lingers out a stunted and profitless existence, to the farmer's sorrow.

I have said above that the supposition of the wireworm being the cause of the disease enables us to account for many otherwise unaccountable appearances. It accounts fully for the disease not making its appearance on the grey moist soil, and for its ravages in the dry red soil; the moisture being destructive to the wireworm, and the dry soil that which agrees with it. It accounts for the disease prevailing in land which has been ploughed for turnip after clover having been either cut or eaten off it. The flowers of the clover attract the parents of the wireworm. Those parents deposit their eggs upon the flowers, or near them. These eggs are left to be ploughed deep down out of the reach of frost by the autumn plough; and the coming spring and commencement of summer, having undergone the needful transformation, they are ready to seize on the tender root of the turnip so soon as it reaches them in the soil.

It enables us to account for another fact; viz., that where the oat crop is damaged with wire-worm the turnip crop will be damaged even to a greater extent. How shall we account for this but by attributing it to the same agency? Having thus stated my opinion of the cause of the disease, and given some reasons to sustain that opinion, I might well leave the matter in the hands of your readers; but, with your kind permission, I will make a remark or two, ere I close, on some causes to which farmers generally have attributed this disease.

First. It has been attributed to *over green cropping*. This is not true. The land on which our turnips have become infected with the disease has not, I may safely say, grown turnips for a century.

Secondly. The disease has been ascribed to the sort of manure used. Now I have tried all, or almost all, the manures used for green crops; in every possible combination, but with no favourable result. The kind of manure, in my opinion has no effect on the disease.

Thirdly. It has been said, again, that the disease is owing in a great measure to the time of sowing. I think there is some truth in this. The common turnip has not suffered with the disease to the same extent as the swede; neither have swedes sown in June been hurt by the disease to the same extent as those sown in May. I attribute this to the time of sowing, and that the wire-worm had then other food which it preferred to it; or, perhaps, at the time when the common turnip had reached the period at which other kinds were

attacked, the wire-worm might be preparing to undergo its transformation into an insect, to make war on the leaves instead of the roots of the turnip, as we experienced, to our cost, last season.

But I feel, Mr. Editor, I have trespassed already too much on your valuable space; I must have done. If the observations I have made lead men of experience carefully to consider the matter, and communicate the result of their observations for the benefit of all, or if it afford a hint which may be useful in leading to a satisfactory solution of the difficulty in the curing or preventing the disease, I shall be more than rewarded for thus directing attention to it.

I am, &c., &c.,

Drumgill, Jan., 1853.

THOMAS JIMOND.

—Wigtownshire Free Press.

### AGRICULTURAL IMPROVEMENTS.

Were it possible for some old intelligent farmer, who lived in this country 150 years ago, to revisit the former haunts of his industry, and take a cursory review of the improved systems and increased productions in agriculture since his time, we wonder what his sentiments would be.

In his youthful and sunny days, he had often, on his way to the distant lime-craig, left that old thatched range of buildings ere break of day, and with his good old "Malley," led by a stout hair-halter, trudged along the foot-tracks here and there bisecting the wide-spread heath, for many weary miles.

Once at the kiln, a bag filled and thrown over Malley's back, formed the fitting load for a returning journey.

A bag of lime each day for two or three of the summer months, the thistles pulled from amongst the corn, and carried to the stable-manger, formed the heaviest portion of the work upon the farm. The winter's labour consisted of the thrashing of the grain and the ploughing of the land for a succeeding crop.

The amusements of ice-playing in winter, and quiting in summer, required and got the largest share of the farmer's time and attention. Rents were low, and prices high; by little labour all could live; and if so, what need for more? To any one accustomed all his life long to look on such a state of things with perfect satisfaction, merely because of his innocent state of ignorance, the utilitarian practices of the agriculturists of the present day would certainly cause considerable astonishment. Looking at the present state of things, it can scarcely be doubted that farming is destined soon to assume its legitimate position as a business, requiring as great aptitude in the discharge of its numerous duties, and as much scientific and general knowledge, as any other profession of the age in which we live.

Great as have been the agricultural improvements of a bygone century, and however far we may have outstripped the practices then so general, we cannot rest contented with this result. No! prejudice, if not eradicated, must cover out of sight; and "onward!" in scientific and practical acquirements, must become the motto of all who would wish to become successful improvers.

Keeping this in view, we are justified in inferring that in a century hence the improvements effected in our agricultural systems, and the increase in our agricultural productions will be far in advance of anything we can at present conceive. By what agency has the heath-clad sheets of land in many

counties been converted into productive soil? How does it happen that a cold wet piece of land, let as a feu to an industrious man, speedily assumes under his management a very different power of production, and in the component parts of its soil is almost changed in its very nature?

All this is the result of judicious and systematic management; and in the case of the feu, the beneficial effects of a suitable concentration of capital are very strikingly illustrated.

If increased production has been profitably secured on a limited breadth of land, it may also be obtained on a farm, provided capital, skill, and perseverance—the lever, the fulcrum, and the agent—are properly applied. If there is one system in agriculture more than another which is likely to effect great and important results to the farmer and the community at large, it is the application of manures in a fluid form, conjoined with the thorough disintegration of the soil.

By liquid manures, we do not mean the discharge from cattle stalls applied to the land by itself, but what may be more properly termed liquefied manure, being the fæces dissolved in water along with the urine, and in that state applied to the soil.

In this way, and by mixing the liquid with such portable fertilizers as the particular plants to be grown may require, they may be supplied in a soluble form, with all the ingredients necessary to develop their structures.

By thorough arterial drainage of the soil, and deep and pulverizing cultivation, suitable drill and other implements, superior house accommodation for stock and the preparation of manures, and by all the aids of science now so happily brought to bear on agriculture, there cannot be a doubt that ere many years the productiveness of this country will be greatly increased.

As the productive power of land increases, its value will also advance; and accordingly, it is perfectly in accordance with sound business calculations to estimate, that the intrinsic worth of land has yet to reach its maximum standard.

Such being the case, the proprietor has his property enhanced by the improvements of his tenant, and will therefore find it to be his interest to let his land to none but improving tenants. On the same principle, it is equally his interest to encourage an improving farmer, by every assistance which can be regarded consistent with sound judgment, for landlord and tenant mutually hang upon one another, and it is only when they both feel this, that they can each be benefited by agricultural improvements.

J. LOCKHART MORTON.

Edinburgh, January, 1853.

**YORKSHIRE AGRICULTURAL SOCIETY.**—We understand that the above society has determined on holding a Christmas show of fat stock and poultry in addition to its summer show. The prizes are, we are informed, on a very liberal scale, as much as £100 being intended to be offered for poultry alone.

**HIGHLAND AND AGRICULTURAL SOCIETY.**—The half-yearly general meeting of this society was held on Tuesday, in Edinburgh, the Earl of Rosslyn in the chair, when the Duke of Hamilton was elected president of the society, in the room of the Duke of Roxburgh, whose presidency has expired.



## AGRICULTURE AND FREE-TRADE.

TO THE EDITOR OF THE TIMES.

SIR,—It is now a twelvemonth since the series of letters appeared in which I concluded my survey of the agricultural districts of England as your Commissioner. I then ventured to indicate the measures of a public character which, in addition to those within the power of individual landlords and farmers, appeared to me requisite, on the part of the Legislature, to place the agricultural interest in a safe position. During the intervening time a great change has taken place in the agricultural feeling, and, “unrestricted competition” having now been declared by all parties to be the rule of future legislation, it becomes those who are more immediately connected with land, as owners or occupiers, to consider whether any trammels hinder them in entering on this course, and in what manner they may best turn to advantage the means which an increased circulation of money and a lower rate of interest have given them. The opportunity which I had, as your Commissioner, of personally investigating the state of agriculture in nearly every English county, and my familiarity with the subject in North Britain, lead me to hope that I shall not be deemed presumptuous in trying to draw attention at the present moment to our position.

The suggestions with which my letters closed in 1851, and which the experience of another year has greatly strengthened, are these:—Facilitate the transfer of land; render it more easily available as a fund of credit; give a partial power of sale, under sufficient safeguards, to the owners of settled estates; encourage leases with liberal covenants; alter the law of settlement, and extend the labourers' opportunities of receiving education; and collect agricultural statistics.

To most of these measures Parliament has now given its sanction, for Ireland. The entire prostration of that country was needed to convince the Legislature of the impolicy of perpetuating encumbered property in the hands of owners who had all the responsibilities of that position without the means of discharging them. The same necessity has not arisen in this country, but in many quarters it is more imminent than is supposed. Nor are just and beneficial measures to be postponed merely because injurious practices which exist have not yet become ruinous. The frustration of land improvement in a country with limited surface is a positive evil which it concerns the Legislature to remove.

Since the report by the committee of the Lords in 1846, the most important recommendation of which was “the improvement of the law of real property, the simplification of titles and of the forms of conveyance, and the establishment of some effective system for the registration of deeds,” repeated attempts have been made to facilitate the transfer of land. The expenses, including stamps, upon a sale of £50 value were proved before that committee to amount to 30 per cent., upon a sale of £100 value to 15 per cent., upon a sale of

£600 value to 7½ per cent., and upon £1,500 to 5 per cent. The difficulty and expense of raising money on landed security, and of transferring the mortgage, is also very great, and both circumstances are found seriously to diminish the marketable value of real property and to hinder it from becoming a favourite subject for investment, except for men of large fortune. It would be a waste of space to dilate on the public and private disadvantages thus occasioned, for they are acknowledged by all who have studied the subject, and seriously felt by those who are affected by it. But, besides this, much of the land of England—a far greater proportion of it than is generally believed—is in the possession of tenants for life so heavily burdened with settlement encumbrances, that they have not the means of improving the land which they are obliged to hold. Hitherto the gradual increase, in the course of years, of the rent of land has saved them from fatal difficulties, but their position is a precarious one. The unprecedented increase in the supply of gold will, no doubt, favourably affect the prices of agricultural produce. But this will not necessarily mend their position, for a rise of rent is dependent more on the increasing number of applicants for farms than on the increased value of farm produce. In ordinary circumstances the one would act on the other, but the temptations of Australia are becoming so extraordinary as to alter all former grounds of calculation in matters of this kind. To farmers of large capital, who are willing and able to avail themselves of every modern improvement, Australia presents no temptation, and the owners of farms who can afford to make such outlays as will place their lands in a condition to be occupied by this class are in a safe position. But the great bulk of the farmers, especially in the midland and western counties, and in the clay districts of England, are industrious men with small capital and large families, who have long carried on an arduous struggle without bettering—nay, even hardly maintaining their condition. These are the very class of men that Australia wants, and there is probably not an instance in which such families, inured to habits of agricultural industry, and needing no assistance in their domestic concerns, have not been entirely successful by going to that country. Its extent and capabilities are so enormous, that no possible immigration can diminish that success, or lessen the inducements which it holds out to similar classes to follow. It would be a serious mistake for landlords to shut their eyes to the possible consequences of a wholesale emigration of this, the most numerous, class of English farmers. Consider the collapse which has taken place in Ireland from the flight of the farmers to America. The competitors for land were no doubt too numerous there, and that country will be in a sounder state when it passes into the hands of extensive grazing

and stock farmers. But to the embarrassed landlord the result is the same—a rental diminished by one-half, the consequence not of low prices, but of absence of competition, or competition confined to a class of capitalist farmers who will only be tempted by low rents. A neglected property in this country, the nominal owner of which is incapable, from his embarrassments, to improve it, will not be looked at by tenants of capital, and tenants of limited means on such a property must be overborne in unrestricted competition with farmers of capital, cultivating land where every convenience and accommodation which an unencumbered landlord finds it his interest to give has been supplied.

The temptations to Australian emigration are even stronger to the agricultural labourer. No possible rise of wages in this country that we can conceive is worth comparing with those which the labouring man can earn in that colony, and the ties of home to the man whose weekly toil has been hitherto so unproductive will be severed without regret. The expense of the voyage is, in fact, the only tie we have upon him, and, sooner or later, we must face a considerable rise in the rate of agricultural wages throughout England. The landlords of this country, therefore, would do well to contemplate in time events which are inevitable—a *diminished competition for unimproved farms, and a considerable increase in the rate of wages*. The first, if it finds them unprepared, will be as ruinous to the embarrassed owners of neglected estates in England as it has already proved in Ireland; and the only remedy for the second is to give every facility which “practice, with science,” can suggest for the successful application of well paid labour to a soil where neither want of drainage, ill-arranged buildings, nor unnecessary fences, diminish or dissipate its effects.

How is this to be accomplished? *By free trade in land*; by facilitating and lessening the cost of its transfer, and by giving to embarrassed owners the power, under sufficient safeguards, of partial sale. Measures directed to this object are vitally important at the present time. The capital which is flowing into the country, and floating about in search of secure investment, would be attracted towards land. Men whose embarrassments deprived them of the power of fulfilling the duties of a false position which the law compelled them to occupy would be restored to credit and self-respect by taking a station the obligations of which were correspondent with their true income, while the fresh enterprise of capitalists, imbued with that commercial spirit which has thriven by free competition, would carry a vigorous life into the cultivation of their newly-acquired estates, which would never rest satisfied with “half crops and whole expenses.”

The next point to which I would refer is the “encouragement of leases with liberal covenants.” This is of much importance in England, where it is supposed that not more than a tenth of the land is held under lease. The larger investment of tenants’ capital which is now required for profitable cultivation, and the greater degree of personal independence which is the effect of a more liberal education, both point to the general adoption of the system of letting lands for a term of years. “Tenant-

right,” or compensation for unexhausted improvements, is advocated by many influential farmers as a good substitute for leases; but the claims which arise under such a right are very indefinite, and practical men differ among themselves as to many points, which some consider fairly to fall under this right, and others think should be excluded. In Scotland a term of 19 or 21 years, with an agreement embracing the operations of the last three or four years, is found to secure the fair rights of both parties in all the ordinary outlays of cultivation. This is a business contract between men, who have themselves to blame if they admit any conditions which are inconsistent with their mutual rights. For durable improvements, such as buildings, drainage, roads, and fences, some of the principles of the bills introduced by the late Government for Ireland might be advantageously applied to this country. These bills (which are substantially the same as those introduced by Lord Lincoln and Sir R. Peel’s Government in 1846, though they are not so precise in their enactments) permit the inheritance to be burdened to the extent of four years’ rental for specific purposes of improvement, to be paid off by an annual rent-charge in twenty-two years. The improvements may be executed either by the landlord or tenant, a certificate from the Board of Works (the Irish Board of Agriculture), certifying that their execution would be beneficial to all parties interested, being necessary before they can become chargeable against the land. If they are executed by the tenant, he becomes entitled to compensation on a certain scale, according to the nature of the improvement, if he is evicted from his farm before the expiry of the compensating periods; but the landlord gets rid of all payment by permitting the tenant to continue his occupancy until those periods expire. It is presumed that these measures would have been accompanied by land improvement loans, for which the present state of the money market is particularly favourable.

As an inducement to landlords to grant improving leases, and to tenants to enter on them with spirit, a land improvement loan would be of the greatest advantage to England and Scotland. The loans of 1846 and 1850 were limited to drainage, which was an injustice to the owners of property in England naturally so dry as not to require drainage. The erection of desirable buildings is scarcely second in importance to drainage, and the present state of the farm buildings, in the southern counties especially, is altogether inconsistent with proper economy either of labour in preparing the crop for sale, or of the food which is given to the live stock, by adequate shelter and comfort. The rambling, rickety, thatched wooden hovels, constantly needing repair, with a court or a shed added here or there, as suited the immediate wants or taste of successive occupants, might do with war prices or protection; but their inconveniences, and the waste of food which they occasion, are incompatible with unrestricted competition. Inconvenient farm roads, and a multiplication of useless fences, are equally opposed to due economy of labour, and their reform might very properly be included in the objects of a land improvement loan.

It must be admitted that Government loans are not

the right means of promoting works which ought to be left to private enterprise. But everything connected with landowning is so hemmed in by legal difficulties that, if we wait for their removal, another generation will go by without satisfactory progress. It is possible that 20 years hence, as the last instalments are being repaid, a way out of these difficulties may have been discovered which will render a repetition of the loan unnecessary.

The recent great floods in England have shown that there is a want of outfall in our rivers and principal watercourses, whose sluggish course is impeded by many obstructions, the removal of which would be a public benefit. These obstructions to the free outlet of the water are becoming every year more injurious, from the extension of land drainage over the country, the effect of which is to bring down into the main watercourses, in one day, a fall of rain which might have slowly and gradually percolated through the soil during a fortnight. The system of arterial drainage, introduced with such good effect in Ireland, is not less needed in England; but there is no department of Government here to attend to these matters, as there is in Ireland; and the isolated complaints of individuals, without any general disaster, are not listened to by Parliament.

The condition of the labourer has undergone a considerable improvement from various causes, and will continue to do so. As labour becomes more costly, it is the interest of the employer that it be more efficient. The power which the present state of the law gives to landowners in "close" parishes to drive the labourers to seek a residence in "open" parishes, by which they are often compelled to reside some miles from the place where they are employed, impairs this efficiency. The contrast in this matter presented by the manufacturer is very ably adduced by Mr. Mechi, in a lecture delivered by him lately at Chelmsford. The cotton-spinner, instead of sending his tired labourers, by a four miles' walk, to their crowded unwholesome hovels, provides cottages with every convenience close to his factory; and, to economize their energies, he carries his work-people from floor to floor by steam. The plough-horse in a "close" parish is carefully provided for in the immediate neighbourhood of his work, but the ploughman must trudge his weary way to his distant home! Now, taking the low ground of economy, and excluding all humane considerations, there could not be a more mistaken practice. The manual labour of an arable farm in England exceeds, on the average, one-third of the entire cost of production, inclusive of rent; and yet the energies of this costly power are heedlessly wasted! It is the clear interest of the employer, as well as that of the employed, to alter a law of settlement which encourages such a system, or which prevents an equalization between the demand and supply of labour. It is equally their interest to promote every means for making the labourer more intelligent and skilful, by extending the opportunities for education to parts of the country where these are deficient.

The next topic to which I shall refer is one the national advantages of which are greatly undervalued—

agricultural statistics. What the returns of the Board of Trade are to the manufacturing, commercial, and moneyed interests, the statistics of agriculture would be both to them and to the statesman, the landowner, and the farmer—a safe and trustworthy guide by which to shape their transactions. No man in this country knows how much of the different kinds of corn is annually produced; whether any particular kind is increasing or decreasing; whether we have after any given harvest ten months' or twelve months' consumption. We cannot tell with anything like precision whether the live stock is becoming more or less numerous—a matter of much importance to the consumer, and not less so to the agriculturist, of whose capital they form an increasingly valuable element. We do not know whether pasture is encroaching on corn, or whether, by better management, an equal quantity of corn is reaped from a diminishing extent of corn land. We hear every day of emigration, but have no means of judging whether, and in what particular quarter, agricultural labour is becoming scarcer, and the means of production more expensive or difficult.

An annual return of the produce of the previous harvest, with quarterly returns of the state of the crops, would, if properly taken, classified, and analyzed, supply the country with information the importance of which can hardly be over estimated. We should then know the quantities of the several kinds of grain disposable for the consumption of the country; whether any, and what kind, was most deficient; whether that deficiency could be made good by an abundance of any other kind of produce, for the season that rots the corn may be favourable to the root crops. Probably not less than a third of the entire corn produce is consumed by horses and cattle. If it were known that corn was deficient and roots abundant, a very large proportion of this could be saved for the consumption of the people.

These are matters of national concern. To the agriculturist the returns might be made peculiarly instructive. The extent of farms, the proportion in the various crops, the average yield of particular counties as compared with others, the quantity of seed used for the various crops, the animal power employed in raising a given produce, the extent of grass and corn land, the proportion in roots, the number of labourers employed on a given area, the rate of wages, the numbers of live stock and how distributed over the country, these would be all learnt from the returns. The landowner and farmer would see whether they were keeping pace with, or falling behind, the general progress; in what particular they excelled or were deficient; whether they employed animal labour wastefully as compared with other counties; whether they fed as much live stock as their neighbours. The progress of improvement would be recorded, and the skilful farmer of one district might be tempted to transfer his skill to another where the average produce of corn and live stock indicated a profitable field for improved management; while he could also form some opinion of the kind of crop which a striking difference between the demand and supply would render most certainly remunerative.

But I need not insist on the importance of this matter to you, for, in publishing my concluding letter last year,

you urged on the Government the advantage of collecting full and authentic agricultural statistics. The only objection ever offered is the cost of collection—a bugbear which some of the official men throw in the face of every successive Minister who attempts to grapple with it. Mr. Henley recently repeated the same answer which has been given every year since the attempt to collect these statistics was first made by Sir Robert Peel's Government in 1846—acknowledging the importance of the subject, but afraid of the expense. Now, what is the importance, and what the expense? The annual produce of corn of all kinds in this island is computed at something more than 40,000,000 qrs. The fluctuation of prices since last harvest, partly caused by the want of accurate information as to the stock of corn in the country, has been not less than 8s. per qr.; that is to say, we cannot tell within £16,000,000 sterling what the crop of last year is worth! Now, what would it cost to get this precious information? From the experience which I acquired in my survey for you I know what can be done in this way, and I am prepared to show that accurate returns of the total corn produce of this country could be procured, within two months after harvest, at a cost below half a farthing per qr., or under £20,000. The cost is, indeed, unworthy of consideration in comparison with the value of the information. It would not be a mouthful in the estimates of a royal dockyard; it is little more than "Mr. Moore's" annual stipend; it would hardly pay the expense of one of General Godwin's war-steamer for a month in the mud of the Irrawaddy; and would be granted without an instant's hesitation to chase an Amatola chief from some obscure corner on the banks of the Great Fish River of Caffraria.

There is but one other point to which I shall refer—the supply of guano. Among the leading members of the present ministry are several men who have a thorough knowledge of the agricultural question, and to whom the great advantage of a cheaper supply of guano to the British farmer is practically known. The increase of crops obtained by the use of that valuable manure has done much during the last four years to mitigate the pressure of the sudden alteration of the corn law. The continued monopoly has now checked its sale, and the importers, finding it a dead weight on their hands, have diminished the supply—the returns of imports for the last ten months showing a decrease of 70,000 tons as compared with the corresponding ten months of the previous year. The supply is known to be practically inexhaustible, and nothing but the monopoly price prevents an enormous increase in its consumption. In June last I suggested, through your columns, that if the Peruvian Government could be induced, by friendly negotiation, to sell the guano at a fixed price, free on board; at the guano islands, they would increase the sale greatly. It is impossible to say how soon other islands with a similar deposit may be found; but such a discovery, or the discovery of a natural or artificial substitute for guano, would at once destroy the monopoly; so that it must be the obvious interest of the Peruvians to sell as much as possible of the article while they have the monopoly of

it. According to their own statements, their present expensive system of agency in this country leaves them only about £3 per ton, after payment of freight and all other charges. Persuade them to levy that sum as an export price when the ship takes in her cargo on the Peruvian coast, and to throw the trade open to all who choose to come on these terms. Without any interference with the rights of Peru, this would introduce the wholesome principle of competition among shipowners, to whom the prospect of return freights for their Australian emigrant-ships is becoming a matter of anxiety. For this purpose some go to India, some to China, but the bulk of the shipping would cross the Pacific, load guano, and make their run home by this route faster than any other. All that is needed is the certainty of obtaining cargoes, as there would be a sufficient margin between the £3 of prime cost and the value of the article here to induce plenty of competition. A reduction of the price by £2 or £3 a ton, which would be the effect of this competition, would be followed by an extraordinarily increased consumption. Twice the present importations might be taken for the wheat crops alone. The Peruvian Government would gain an increase of revenue, with less risk and less expense in the collection. The landed interest in this country would benefit by the reduction in price, and the shipping interest by an increase of employment.

I have, by your permission, taken advantage of the present pause between the accession of the new Government and the announcement of their policy to draw public attention to the agricultural question. It is not enough simply to acknowledge that unrestricted competition is to be the rule in this country. Every remediable condition which, without benefit to any class, continues to embarrass the free action of landlord, tenant or labourer, or impedes the improvement of the soil, should now be removed. When that is done, the true interest of landowners would be to give up the chimera of party political advantages and become Financial Reformers, in which, from their position, they have the deepest interest of any class in the community. If the wonderful resources of Australia should attract thitherward any great movement of our population, on the fixed property of this country will fall at last the additional burden of a national debt, towards the payment of which there will be a diminished number of contributors. No class has, therefore, a greater concern in keeping down all extravagant public expenditure, and thereby encouraging good order, prosperity, and stability. The home market is theirs, though with diminished prices, which must be met in agriculture, as they have been in manufactures, by increased production. Where three quarters of wheat were formerly grown we must try to raise four or five; where 30 cattle were formerly fed we must try to feed 40 or 50. This can be done. The best farmers in all parts of the country will be the first to acknowledge it. But capital must be expended—by the owner of the soil in drainage, farm buildings, and roads; by the tenant in adequate cultivation; by the labourer in skilled labour. The owner pleads want of capital; the tenant want of security; the labourer insufficient motive.

I trust that the suggestions contained in this letter, which are the result of a very extensive inquiry into the subject, may help in some degree to indicate measures

which would reconcile and promote these mutually dependent interests. I am, Sir, yours faithfully,  
JAMES CAIRD.

CENSUS OF IRELAND—1851.

The following are extracts from the agricultural returns:—

PART I.—CROPS.

From the accompanying tables it will appear that the total number of holdings has continued to decrease. The entire reduction between the years 1850 and 1851 is 20,156—which is, however, 2,767 less than that which took place between 1849 and 1850, although at the same time the returns for 1851 exhibit an increase of 2,402 in the holdings under one acre.

This lessening ratio of decrease in the total number of holdings, year by year, is naturally to be expected; but as that circumstance, as well as the gradual increase during the last two years of the smaller class, is worthy of observation, the following figures are annexed:—

Total holdings.			
No.	1849.	1850.	1851.
No. ....	651,115	628,222	608,066
Annual decrease ..	—	22,923	20,156
Holdings not exceeding one acre.			
No. ....	31,939	35,324	37,728
Annual increase ..	—	3,387	2,402
Holdings exceeding one acre.			
No. ....	619,156	592,896	570,338
Annual decrease ..	—	26,260	22,558

The Census Commissioners of 1841 omitted from their returns all holdings not exceeding one acre: and owing to the difficulty of accurately ascertaining their exact number, and the fact that occupiers of this class are mingled to a considerable extent with persons not depending on agriculture for their support, more particularly in the vicinities of towns, their omission from the number of landowners has numerous advantages when treating of the changes in the division of land which is now in progress in this country; yet their importance in other respects is so great that a report of this kind would be imperfect without some notice of them.

The table presents an apparent anomaly when compared with the tillage returns, the latter showing an increase in the total quantity of cultivated land, whereas the former shows a decrease in the number of farms of all classes.

Similar results were observed upon by Major Larcom in his remarks on the agricultural returns of 1850, and a higher classification than 30 acres suggested, in order to do away with the seeming contradiction, as it is evident that it arises from the increasing number of farms of a larger class—farms of 300, 400, and 500 acres absorbing many of those “above 30 acres,” which was the maximum in former inquiries. An extended classification has therefore been adopted in these returns, dividing the entire number of holdings above 30 acres in 1851, into the five following classes, viz.:—

Above 20 and not exceeding 50 acres .....	70,093
“ 50 “ “ 100 “ .....	49,940
“ 100 “ “ 200 “ .....	19,753
“ 200 “ “ 500 “ .....	7,847
“ 500 acres .....	1,457

The details of this classification by counties will be found in the summary tables. This being the first year in which an extended classification was adopted, no comparisons with

former years, having reference to these classes, can at present be made. The original returns of the previous years have, however, been carefully preserved, and abstracts from them, according to this or any other classification, may hereafter be compiled, should the subject be considered of sufficient importance.

The following table shows the changes which have taken place in the several classes of holdings exceeding one acre in extent, between 1841 and 1851:—

Classes of holdings.	No. of holdings in 1841.	No. of holdings in 1851.	Decrease.	Increase.
Number above 1 and not exceeding 5 acres .....	310,375	88,083	222,292	—
Number above 5 and not exceeding 15 acres .....	252,778	191,851	60,924	—
Number above 15 and not exceeding 30 acres .....	79,333	111,311	—	61,973
Number above 30 acres .....	18,623	149,090	—	160,467
	691,114	570,338		
			Total decrease.	120,776

The census of 1841 did not enter upon the question of tillage; there are therefore no data for a minute comparison under this head. According to the “division of land,” as given at page 452 of the “miscellaneous tables, which accompany the commissioners’ report, the quantity of arable land in Ireland in 1841 was 13,464,300 acres; the amount according to these returns is now 14,802,581, showing that the extent of cultivated land has been increased by 1,338,281 acres during the last ten years; and from 1817 (the first year in which the extent of tillage was recorded) to 1851 the quantity of land under crops has been also extended from 5,238,575 to 5,858,951, thus showing an increase of 620,376 acres. This increase will be found to be spread over every county in Ireland, except Limerick, in which the extent under crops in 1851 is 975 acres less than it was in 1847.

The changes which have taken place in the relative proportions of one class of crop to another within the last four years also indicate an important alteration in the management of farms in Ireland. In the year 1847 the proportion of cereal to green crops was, in acres—four six-tenths to one; whilst in 1851 the proportion was two three-tenths to one. The following table shows the great increase in the extent of flax cultivated in each province in Ireland:—

	1850.	1851.
	Acres.	Acres.
Leinster .....	1,801	4,889
Munster .....	2,694	5,991
Ulster .....	85,065	125,407
Connaught .....	2,080	4,249
Total of flax .....	91,040	140,536

The succeeding table shows the extent of each description of crop in 1850 and 1851:—

	1850. Acres.	1851. Acres.
Wheat .....	604,876	504,218
Oats .....	2,142,596	2,189,775
Barley .....	263,350	282,617
Bere .....	57,811	53,347
Rye .....	18,342	19,697
Beans .....	62,590	28,535
Peas .....		21,182
<b>Total of cereal crops ..</b>	<b>3,149,556</b>	<b>3,099,401</b>
Potatoes .....	875,357	868,501
Turnips .....	317,331	383,548
Mangel wurzel .....	20,390	25,847
Other green crops .....	74,404	74,419
<b>Total of green crops ..</b>	<b>1,317,572</b>	<b>1,352,315</b>
Flax .....	91,040	140,536
Rape .....	—	20,291
Meadow .....	1,200,124	1,246,408
<b>General total .....</b>	<b>5,758,292</b>	<b>5,858,951</b>

Another table shows the proportion which each description of crop, as cultivated in 1851, bore to the 100 acres on each class of holding.

The distinguishing features of the table are the diminishing proportions which oats, barley, potatoes, and flax, as grown upon the larger farms, bear to the proportions of these crops on the smaller farms; the difference is supplied by increased quantities of turnips, "other green crops," and meadow. Wheat was most extensively grown upon farms from 50 to 100 acres; but the largest proportion of cereal crops (57 2-10 per cent.) is shown to belong to farmers holding from 5 to 15 acres, though but little difference, in this respect, exists between the four classes above 5 up to 100 acres. The greatest extent of flax is grown upon holdings from 1 to 15, and from 15 to 30 acres.

The largest proportion of meadow (45 6-10 per cent.) belongs to the class "above 500 acres;" on this class is also cultivated the greatest proportion of turnips, "other green crops," beans, and peas; but wheat and other hard grains, as also potatoes and flax, are cultivated to a comparatively limited extent.

The rate of produce of the wheat crop in 1851, though somewhat higher on the average than in 1850, is yet very low. Oats also show a slight improvement. The rates of produce of barley and bere exhibit little or no change. Slight increases appear in rye, beans, and peas, potatoes, turnips and mangel wurzel.

An estimate of the quantity of corn, beans, and peas grown annually in Ireland since 1847 has been made from the returns, of which the following is an abstract:—

Crops.	1847.	1851.
Wheat .. (brls. of 20 st.) ..	4,916,599	2,508,963
Oats ... (brls. of 14 st.) ..	18,433,399	17,232,874
Barley ... (brls. of 16 st.) ..	2,489,330	2,482,992
Bere ... (brls. of 16 st.) ..	423,978	442,752
Rye ... (brls. of 20 st.) ..	102,273	157,537
Beans and Peas .. (bnsh. of 8 gals.) ..	675,649	1,283,610

The variety of measures in general use in Ireland, and of necessity adopted in these tables, renders the quantities unfit to be added together, until reduced to one common standard. The following table exhibits the total produce of the above crops, reduced to tons of 2,240 lbs. each:—

Years.	Tons of produce.	Years.	Tons of produce.
1847 .....	2,548,503	1850 .....	2,113,327
1849 .....	2,182,514	1851 .....	2,165,854

The succeeding table shows the total produce of potatoes and turnips, also given by tons:—

	Potatoes. Tons.	Turnips. Tons.	Carrots and Parsnips. Tons.
1847 ....	2,043,195	5,760,616	(Not known)
1849 ....	4,014,122	5,805,848	101,727
1850 ....	3,945,990	5,439,005	83,622
1851 ....	4,441,022	6,081,326	87,627

We have no means of computing the proportion of the above produce consumed as human food; yet the quantity per head produced in each county or poor law union affords a tolerable criterion for judging of their present comparative capabilities.

The greatest quantity of cereal crops, in proportion to the inhabitants, was grown in Meath, Kildare, Wexford, Westmeath, Louth, and Kilkenny. The counties of Clare, Sligo, Galway, Leitrim, Mayo, and Kerry show the lowest averages:—

	Highest. lbs.	Lowest. lbs.	
Meath—prod. per head	1,334	Clare—produce per head 620	
Kildare do. ..	1,420	Sligo do. ..	574
Wexford do. ..	1,338	Galway do. ..	556
Westmeath do. ..	1,210	Leitrim do. ..	540
Louth do. ..	1,159	Mayo do. ..	507
Kilkenny do. ..	1,094	Kerry do. ..	355

The under-mentioned twenty poor law unions have been selected to show which produce the largest proportion of cereal crops for each individual inhabitant, and those whose averages are the lowest:—

	Highest. lbs.	Lowest. lbs.	
Athy—prod. per head	1,731	Glenties—prod. per head 294	
Dowpatrick do. ..	1,677	Bantry do. ..	284
Castletowndelvin do..	1,653	Newport do. ..	279
Kells do. ..	1,613	Dingle do. ..	258
Gorey do. ..	1,599	Galway do. ..	246
Emisecorthy do. ..	1,582	Calheriveen do. ..	226
Ardee do. ..	1,581	Skull do. ..	217
Navan do. ..	1,856	Cliden do. ..	216
Dunshaughlin do. ..	1,527	Kennmare do. ..	196
Balrothery do. ..	1,499	Castletown, co. Cork, do.	127

PART II.—STOCK.

The Census Commissioners of 1841 having inquired as to the number of acres of arable, pasture, and waste land in every farm in Ireland, and having also ascertained the number of horses and mules, asses, cattle, sheep, pigs, and poultry, on each holding in that year, the abstract of the returns published in their report affords a valuable basis for comparison with those in 1851.

Subjoined is an abstract of the total amount of each description of stock in Ireland in 1841, and also in 1851:—

	1841.	1851.
Horses and mules ..	576,115	543,312
Asses .....	92,365	136,981
Cattle .....	1,863,116	2,967,461
Sheep .....	2,106,189	2,122,128
Pigs .....	1,412,813	1,084,857
Goats .....	—	235,313
Poultry .....	8,458,517	7,470,694

This table shows a gradual diminution in the number of horses and mules; the decrease within the ten years being 32,803. Pigs, though greatly increased since 1847, have not yet reached the numbers shown in 1841, the deficiency as between that year and 1851 being 327,956. Goats were not enumerated in 1841, but their numbers have considerably increased since 1847. Poultry have also increased since 1847; but they are yet under the number in 1841 by 987,823. The number of horned cattle in each period shows a considerable augmentation; the increase within the ten years being 1,104,345.

The Census Commissioners of 1841 not only made an enumeration of the stock at that time in Ireland, but also,

after inquiry, assumed an average rate per head for each description—viz., horses and mules were valued at £8 each, asses at £1, horned cattle at £6 10s., sheep at £1 2s., pigs at £1 5s., poultry at 6d. By this means they arrived at an approximation to the value of the entire stock in Ireland in 1841. There is every reason to think that were the inquiries on this subject now repeated, horses and mules, cattle, sheep and pigs would be estimated at higher rates; but as any alteration in these rates would disturb the comparison with previous years, it has been thought judicious to adhere to the prices adopted in 1841. A general view is thus afforded of the extent of the changes which have taken place since that year in this important branch of farming:—

Years.	Total value of farm stock.
1841 .....	£21,105,803
1851 .....	27,737,393

In contrasting the number of holdings with the value of stock in the years 1841 and 1851, it appears that although the number of holdings has diminished by 120,776, and the gross value of stock in the possession of landholders has increased by £7,926,307, the landholders in each class have on an average a less amount of stock on their farms respectively than they had in 1841, thus showing that stock on the two smaller classes of holdings (*i. e.* from 1 to 5 and from 5 to 15 acres) has diminished more rapidly than the number of holdings, and that, although the stock on the two larger classes, (*i. e.* from 15 to 30, and above 30 acres) is increased, the increase is not in proportion to the greater number of large holdings; and that a further augmentation of the stock to an extent of £5,700,000 in value, is required to make the average amount of stock on each class of holdings in 1851 equal to what it was on the same classes in 1841.

The demand for this increase necessarily arises from the enlarged size of farms; thus, if a farm of 5 acres with its stock be added to one of 15 acres with its stock—as existing in 1841—the latter becomes a holding of a higher class, but with a stock value for only (£9 17s. 6d. added to a £22 11s. 7d.) £32 9s. 1d., being £14 under the average value per holding of

the class to which it has been raised by the union of the two farms.

In the forms for "stock" issued in 1851, a column for the number of deer was for the first time introduced. By the returns received, it appears that there were then in Ireland 17,175 of these animals, their distribution by provinces being:

In Leinster .....	4,857
In Munster .....	7,008
In Ulster .....	3,380
In Connaught .....	1,930

Total number of deer in Ireland in 1851.... 17,175

The general tables of stock show their distribution throughout the country by baronies and counties.

The publication of these returns is later this year than usual, owing to the increased size of the present work, caused by the more detailed classification of farms, and also to part I, containing the townland census of Ireland, being in the press at the same time. The latter work, which has been published by counties, and is comprised in four volumes—being one for each province—is now printed and presented to both houses of parliament.

In conclusion, we beg to observe that upon reviewing the circumstances of the country, in connexion with the foregoing tables, and considering the painful vicissitudes through which it has lately passed—caused by the annual blight of the potato crop since 1845—the diminished rates of produce of the grain crops for some years, and the number of cattle which have died of diseases hitherto comparatively unknown in this country—we cannot but congratulate your excellency upon the evidence which these tables afford of the steadily increasing amount of farm stock, and the generally improved condition of agriculture in Ireland.

We have the honour to be your excellency's very faithful servants, WILLIAM DONELLY, } Chief Commissioner.  
Registrar-General.

WILLIAM R. WILDE, Assistant Commissioner.

EDWARD SINGLETON, Secretary.

Census-office, Dublin, Nov. 30, 1852.

## THE SHOWS OF FAT CATTLE AT THE CLOSE OF THE YEAR.

The shows of fat cattle are the chief theme of agricultural interest at the close of the year. Great as have been the declamations against fat animals, which have been over and over again caricatured as "mountains of fat" and "giants of obesity," the public curiosity, taste, and feeling on the subject may be easily tested by the wide spread of fat-cattle shows, and the great public appreciation of such exhibitions. Under the most lashing ridicule which certain papers were capable of inflicting, the Smithfield Club Cattle Show has gone off with the most brilliant success. Five hundred and fifty-five entries of fat stock alone; while it accumulates animals sufficient to satiate the curiosity of the greatest amateur, is a pretty accurate indication of the feeling out-of-doors both as to the fattening and purchasing of this class of animals.

Then the Birmingham or Midland Counties Show, following in the same train, is one of the most wonderful provincial exhibitions of fat stock:

and poultry have there been added, of dimensions as large and proportions as outgrown as the largest Devon ever exhibited. We are afraid almost to give the number of entries, so many being poultry; but the public appreciation of this show is so high that, last year, in the four days, they had an income, from visitors alone, of £1,630. On the private view, this year, 8,000 persons were congregated in the yard.

Newcastle has followed in the train, and a very encouraging and successful show of fat stock has been held there; while the celebrated and well-managed Yorkshire Agricultural Society has appointed a committee to consider whether it cannot found a similar show in that county, in addition to its summer exhibition of breeding stock.

Thus, while violent attacks have been made on fat shows, they are only increasing in number, and popularity, and in variety of the specimens; the demands for these enormous aggregations of

fat are so great, that they are scarcely adequate to the supply. We heard the other day of two *unsuccessful* animals which were sold for £70, and the buyer had £30 offered for his bargain.

If parties knew what they were about, they would make a distinction between *breeding* and *fat* animals. The over-fattening of breeding animals we reprobate as much as any one can do, though we agree with Mr. Towneley—one of the greatest prize-winners of the day, and one of the most successful breeders of shorthorns—who says, that it is difficult to keep some animals lean; but, while we say breeding animals ought to be kept as lean as possible, and the form regarded more than the condition, the fatted animal must be made fat, or it ceases to be a specimen.

The one is the raw material, whose quality is best judged of in its undressed state; the other is the cloth, to which the last finish must be given, though it disguises many of its qualities. Keep, therefore, the raw material in its natural state; finish the manufactured article as highly as you possibly can. To show the latter unfinished is as absurd as it is to give polish and artificial lustre to the former; and so long as these particulars are kept in view, fat cattle and poultry shows will be valuable, as showing the capabilities of each particular breed and class of animals.

It is idle to say they do not repay the cost of feeding. Perhaps the individuals do not. But they show the capabilities of the breed taken, with indications of quality, symmetry, and age, which no judgment of the lean state would be capable of conveying. They are the *results of practice* brought to bear on the *judgment of science*.

Nor will the practical feeder attach much importance to the objection that any animal may be made fat. There are some which at an early age cannot be fattened at any cost or risk; even "ram and

new milk"—Mr. Outhwaite's wager-experiment—would not do it. So that the fact of getting fat early, and largely in the best joints, is a matter of no small information to the breeder and the grazier.

The records of these societies, however, are of still more value. They show the most feeding kinds of food, or mixtures of food the most successful, adopted by the different breeders. Thus, the best shorthorn was fed on "hay, mangold-wurzel, pea-meal, and oilcake"; the best Hereford in the like class was fed on "barley and bean meal, linseed-cake, turnips, mangold-wurzel, *pumpkins*, and hay"; the corresponding Devon, a small early breeder, on "hay, grass, roots, oilcake, flax seed, and barley." In the class of Scotch, Welsh, or Irish, the first prize animals had "hay, roots, barley meal, and linseed cake."

We shall not proceed to classify the whole, or, indeed, to select any more specimens. But this is abundantly clear—that while roots of some kinds really produce the watery properties, and hay to fill the stomachs of the animals, seem to be indicated, the great sheet-anchors of feeding are linseed-cake, or, as it is commonly called, oilcake, to afford the fat-forming and respiration-sustaining materials; the bean or pea meal is equally valuable for supplying the flesh-forming substances.

Into the question of cost we will not at present enter; but it is patent on the face of it that, for the amount of flesh in a given time, irrespective of cost, roots in abundance, with oilcake and pea meal, are by far the best combinations for feeding animals. A supply of malt will have a wonderful influence on the secreting vessels of the skin, and produce a fine coat; hence no small advantage would accrue to the farmer in feeding his stock, by the total repeal of that duty we have laboured so incessantly to accomplish; which, however, we lament to say, through a change of ministry, is again *adjourned*.

#### THE EFFECTS OF EMIGRATION ON THE AGRICULTURAL INTEREST.

The monthly meeting for October of the Winchester Farmers' Club, was held at the Black Swan inn, Winchester, on Saturday October 30th, Mr. R. Pile in the chair.

Mr. W. PAIN gave notice that the subject for discussion at the November meeting would be brought forward by Mr. John Twynam, on "The covenants between Landlords and Tenants, as most conducive to their mutual interests."

The CHAIRMAN said the subject for discussion on that evening was the effects of emigration on the agricultural interest, which was deserving of their best attention when such an authority as Sir Fitzroy Kelly informed them that the produce of

wheat in England since 1846 has decreased 1,500,000 quarters per annum; and it is now ascertained by Captain Larcum's report, that the wheat grown in Ireland is less by 1,500,000 quarters; together 3,000,000 quarters less of wheat annually is raised in England and Ireland since 1846; and supposing that an equal amount of other kinds of grain has gone out of cultivation, which is a most moderate supposition, seeing that ten million quarters of foreign grain are now annually imported when there were not two millions before, we have six millions less quarters of grain annually raised in Great Britain than was done before. The defalcation has been nearly as great in the supplies of



cattle and sheep and other animals brought to the English market, seeing that 303,976 foreign animals were imported in the year ending 5th January, 1852, and beyond all doubt the value of the produce that is raised has sunk a fourth. The total agricultural produce of England and Ireland has been estimated, before 1846, at £250,000,000. At this rate the loss the cultivators have experienced from this source alone is above £60,000,000 a year, or more probably £75,000,000; and by the following return, shewing the emigration from the British islands for six years before and after 1846, will enable you to judge of the effect it must have upon the agricultural interest, bearing in mind that none but the able-bodied and best labourers of good character emigrate, leaving the non-productive, the old and young, and infirm, and indolent, and dishonest, to be supported by the parochial rates. Emigrated in the years

1840	.....	90,743	1846	.....	129,851
1841	.....	118,592	1847	.....	258,270
1842	.....	128,344	1848	.....	248,089
1843	.....	57,212	1849	.....	299,498
1844	.....	70,686	1850	.....	250,896
1845	.....	93,501	1851	.....	335,966
		<u>6559,078</u>			<u>6,1552,570</u>

Average .. 93,179                      Average .. 258,761

In all probability the emigration this year will reach 350,000, or 500,000. There is also another point worthy of attention. The amount expended for the relief of the poor in 1850 in England and Wales was greater than any year since 1836, except 1848 and 1849. The expenditure of 1850 was only a farthing per head on the population less than the average of seven years of the highest price of corn. The expenditure in the five years ending 1851 was greater than in the five preceding years by above £2,500,000, and greater than in the five years before that by £5,717,091. The seven years during which the price of wheat was highest, there was the lowest amount of expenditure. In 1851, levied for the relief of the poor, £9,778,914, in England and Wales. In 1847 the amount in the Savings Banks fell from £31,743,250 to £30,207,180; in the next year it was £28,114,136; in 1849 it was £28,537,010; and in 1850 it was £27,198,563. This is the last year to which the returns have been corrected. The population, by the census of 1851, England and Wales, Scotland, Islands in the British Seas, army, and navy, and merchant seamen, amounted to 27,619,866; in 1841, 26,825,000. The annual increase of the population prior to 1845 was usually considered to be 1000 a day, or 365,000 a year, and this was for long a subject of congratulation and boast. The population returns for 1851, however, showed

that, down to the end of 1846, it was only 230,000 a year. But now, as 330,000 emigrants leave the British shores every year, there is an annual decrease upon the whole of 100,000 souls, and that not of infants or worn out old persons, but chiefly young men and women in the prime of life; and, in referring to Spackman's Tables, at the time of the census in 1841, there were in the United Kingdom—

Engaged in agriculture	.....	3,444,000
Dependent on agriculture	....	14,125,000
		<hr/>
Total	.....	17,569,000
Engaged in and dependent upon manufactures	.....	9,356,000

Thus, out of 26 millions of inhabitants, 17½ millions of the agricultural classes. The following is an extract from *Blackwood's Magazine* of last August:—"As the increase of population, in a healthy and thriving state of society, leads to an additional increase, and constantly adds to the breadth of the basis on which the pyramid of the national prosperity is rested, so a decline in the numbers of the people is attended by a precisely opposite effect. In the first case, the prosperity of every one class reacts upon the prosperity of every other class; in the last case, their suffering communicates itself in an equally decisive way to every class around them. As thus the great trade of every nation is that which goes on between the town and the country, and each finds its chief market in the wants of the other, it is impossible that either can suffer without the other class dependent on the sale of its produce suffering also. Extraneous causes, simultaneously acting on the market, may for a time prevent this effect becoming conspicuous; but, in the long run, it is sure to make itself felt. If the farmers are suffering, the manufacturers will speedily experience a falling off in the home market; if the manufacturers, the farmers are as certain of finding a diminution in the consumption of their produce;" evidently proving that their interests are identical, and that emigration must be injurious to them, and that it is desirable, and would be most beneficial, for them to be united in endeavouring to promote each other's welfare, by retaining and employing all our industrial classes at home in Great Britain, in which there is ample employment for all the agricultural labourers, if the capabilities of the soil now in cultivation were fully developed, and all the waste land capable of improvement were brought into cultivation; and this would be the means of giving full employment to all the other industrial classes, and, by the blessing of the Almighty, we should then be able to produce sufficient food from our native land to support our own population, without being dependent on the caprice

of foreigners, or the winds and waves, for our daily bread. And, instead of class fighting against class, if all would unite to obtain justice from the Legislature for each class, and placing the burdens of the country equitably upon each, and upon all descriptions of property in this realm, and give them freedom to take their labour to the best market, and relieve them when requisite, were located, at the national expense—then Englishmen may yet again be prosperous and happy, and England still continue the first monarchy in the world. I will now call upon Mr. Wm. Spearing to give us his opinion and information upon this subject.

Mr. SPEARING, in introducing the subject on "The Effects of Emigration on the Agricultural Interest," said he rose with feelings of great diffidence to bring before the Club the subject of discussion on that evening, knowing that there were many present much more competent to have introduced it than himself; but the worthy Chairman, by the introduction of the statistics which he had read, had taken a great portion of the burden from his shoulders, and little remained for him to do in bringing the subject forward. I believe (said Mr. S.) the system of emigration is one which will most seriously affect the agricultural interest—that interest with which, I may say, we are one and all more or less intimately connected, and that I believe beyond what many anticipate. I do not expect but that among the members of this Club there may be some difference of opinion on this subject; therefore, I will endeavour to state my views on it as briefly as possible. There can, I conceive, be little doubt that a system which causes the departure from their native soil of such a vast quantity of our countrymen, is in itself entirely wrong; but when we consider its present and probable effects on our interest, the short supply of good able-bodied labourers caused by it, the rise in the price of labour consequent on the short supply—the diminution in consumption, a natural consequence arising from the number of emigrants—and various other causes; I say the effects will, in my opinion be most injurious. That you may form some idea of the vast quantity of persons who are now migrating, and the great increase which has lately taken place, I will briefly call your attention to a few facts connected with it. They are from the Twelfth General Report of the Colonial Land and Emigration Commissioners for the year 1851, which has lately been presented to both Houses of Parliament. It states—“The total emigration from the United Kingdom in the 20 years ending 1851 has amounted to 2,640,848, but of this number more than one-half has taken place within the last five years. During

the 15 years ending 1846, the whole migration amounted to 1,218,174, or an average of 81,211 persons a year, the largest number in any one year being 129,851 in 1846. In the five years from 1847 to 1851 inclusive, the emigration amounted to 1,422,672 persons, or an average of 284,530 persons a year, being considerably more than double the emigration of 1846.” As Mr. Pile has given you the number who have emigrated in the respective years, it is not necessary that I call your attention to them. I would ask, with this continual drain on the labour market, consisting as a great number of the emigrants undoubtedly do, of some of the most healthy, able, and strong of our adult population, whether our interest will not be seriously affected; and in considering this subject you must bear in mind that these emigrants are not the cleaning out of our workhouses, are not of that class whose departure would relieve us in the shape of poor-rates, but they are in a great many instances amongst the most useful of our labourers. In the summer months I believe a great number of us in this neighbourhood find labourers very scarce; we are, in fact, dependent upon other and more populous districts for hands to cut our corn, hoe our turnips; and it is a fact which I believe cannot be concealed that the work is very frequently most indifferently done. I know that, not far from me, there are large quantities of turnips which were never hoed, from want of hands; and this want has been occasioned by the emigration of such a large portion of our population. There will be another evil arising out of this system, and that is a rise in the price of labour, the necessary consequence of a short supply; this has an effect very injurious to our interest, inasmuch as it raises materially the cost of producing, whilst we are selling our corn at a very low price, and, by depriving us of such a quantity of our best labourers, we are obliged in a great many instances to submit to having our work done very indifferently. It also tends to make the labourer discontented with his lot. He sees one and another leaving this country, and he naturally enough wishes to improve his condition; at least, he considers so, but from some cause or other is prevented; he then becomes regardless of your interest, and in a measure to his own. This emigration will, I doubt not, make the occupier of the soil look more to the use of machinery in the performance of his labour, and I cannot but imagine that in a few years we shall see it much more extensively used than at present; there has lately been a great improvement in agricultural implements, and with the vast competition in their manufacture, I trust that they may still improve, so as to come more within the reach (as far as regards practical

utility and cheapness of price) of the great majority of the tenant farmers of this country. I have looked in vain to see where this rush of people from our shores affects us for good; I do not see in the agricultural districts poor-rates materially decrease or crime diminish, because it is not the frequenter of the workhouse or gaol who emigrates. This question of emigration is one which now seems to be engaging the attention of those connected with agriculture. Mr. Henley, the President of the Board of Trade, at a meeting in Oxfordshire not long since, made the following remarks—he said, “That in consequence of the exodus of our people and the diminution thereby of the supply of labour, there was no difficulty likely to be experienced in the employment of unnecessary labour.” He adds, “What the effect of thus stripping the land of its sinews and strength will be, God only knows; but the real fact is, that in Ireland, from the misery of the people, and England from the hope of gain, the people are rushing from our shores in every direction.” I would ask whether the effects of such a system as this are not likely to be seriously felt. This emigration adds another to the list of injuries under which we have been so long suffering, one which is not likely to be very quickly or easily remedied, for with the prospect held out to persons desirous of benefiting themselves in Australia and other places, and the slight encouragement given in this country to those connected with agriculture, I cannot but imagine that a still larger quantity of persons will be induced to leave this country. It strikes me that those who are devoting their money to the promotion of emigration would benefit that class whose condition no doubt they desire to improve, in employing them a few months in the dead of winter in some useful undertaking, for there is plenty of room here for the outlay of capital in that way; and in the summer months they would be sure to find employment: by doing this, they would be conferring a benefit on the occupier of the soil as well as on the labourer himself. If you regard your own interest, you will do nothing to promote that system which will only injure you, either by directly or indirectly favouring it. In drawing to a conclusion, allow me to remark that this continual emigration is, in my humble opinion, fraught with the most ruinous consequences to the cause of British agriculture; it is one which is taking away from us a vast quantity of those who help to produce as well as consume our productions. Trusting you will not attribute my inability to do justice to the subject to any want of inclination to support this club, I will now read, in accordance with our usual custom, a resolution, which can be altered to suit the views of those who

are present. Mr. Spearing concluded by moving the following resolution:—

“That, in the opinion of this club, the effects of emigration are most injurious to the agricultural interest.”

Mr. WALTON said that the subject brought forward for discussion was most important and interesting, and he was pleased with Mr. Spearing's address, except one part, wherein he expressed a desire not to promote emigration. It was true that in consequence of the improved mode of cultivation now introduced, the farmers required more hands, particularly in certain seasons of the year; still he should be sorry that anything should come from Mr. Spearing, or any other member of the club, to prevent the labourers or any other classes of the community from striving to better their condition. He himself should be extremely sorry, if he had ever so valuable a labourer, to throw any obstacle to his attempt to improve his condition; and he hoped the farmers would endeavour to secure their services by giving them constant work and increased prices; for they might rest assured that although some might be desirous of emigrating, a greater portion of them would much rather remain at home, in consequence of their family ties and connections. He was of opinion that no steps should be taken to prevent emigration, and read an extract from a pamphlet, entitled *Tracts for the Million*, in support of his argument. He believed, generally speaking, that the labouring classes were in a wretched condition; but they were a great deal better off now than they were in the dear times. To some of his own labourers he gave eight shillings a week, and the women earned something besides, and were able to dress in white silk frocks and black silk polkas. Every other class of the community was prosperous except the agriculturists. Now there must be some grand secret in this; for it was well known that other classes were making large fortunes. He had every desire to promote the interest of the labourers, and thought that something might be done to keep them at home; but this alone rested with the landlords; for if they would give security to their tenants, by introducing substantial covenants into their leases, they would enable the latter to raise a better supply of food, and an excess of labour must be the consequence. He contended that the landlords of England were the principal cause of the present state of things, because they withheld that security which would enable their tenants to grow food for the million, and thereby benefit the condition of the labourers; but, unless a change took place, emigration must still go on, and that to a fearful extent. The only remedy to prevent this was to give encouragement to the best labourers by se-

curing to them constant work and remunerative wages. This boon entirely rested with the landlords, who must give to their tenants security for their capital, and compensation for unexhausted manure left in the soil and other improvements.

The CHAIRMAN inquired if it was the opinion of the members that emigration was injurious to the agricultural interest, observing that it was usual for them to confine the resolution to the subject brought forward, for they were not now assembled to point out a remedy, but to elicit an opinion whether emigration was considered injurious or not. He perfectly agreed with Mr. Walton that the present state of things was chiefly in consequence of the farmers never having been placed in their proper position.

Mr. J. PARMITER observed that as labour was property and a marketable article, the labourer naturally sought the best market the same as a farmer did for the sale of his wheat, sheep, and oxen. He dilated at some length on the advantages derived from education, and the good effects produced by the school established at King's Somborne by the Rev. Mr. Daws, now Dean of Hereford.

Mr. NAISH inquired if it had been generally ascertained that the greater number of the emigrants were agricultural labourers, for he had been told that Bank of England and other clerks had quitted the country.

Mr. WALTON said that not one hundredth part of those who emigrated were agricultural labourers.

Mr. EASTON observed that it having been suggested that emigration had a tendency to injure, he would, by way of amendment to the original resolution, take the sense of the meeting on that question.

Mr. W. PAIX thought it must be acknowledged on all hands that for some years past, whether it arose from the great increase of emigration or from increased cultivation of the soil, they were in a position to feel a deficiency of labourers; although he had not felt the want of them so much as many others, which arose from the circumstance of a public road running through his farm, and labourers from Wiltshire and Dorsetshire passing by, which gave him a better opportunity of obtaining their services than those who lived in more remote situations at a distance from a turnpike road. The farmers certainly had been short of labourers for some time, and must no doubt call in the aid of machinery and other things to supply the deficiency, to enable them to compete successfully against the foreigner. No doubt the agricultural labourers who emigrated were the best men—men who had some slight degree of education, of some talent,

who looked forward to bettering their condition, who looked beyond the poorhouse, depending on their own personal energies, and would sooner leave their homes for a country where they could get better wages, and be enabled to lay by something to support them in the hour of need. In some parts of the country no doubt there was a surplus population, which materially increased the poor-rates in consequence of many labourers being out of employment during the winter season. Now if those gentlemen who so philanthropically exerted themselves in promoting the emigration of labourers would bring them on their own estates, and employ them in draining, chalking, and grubbing, they would confer a greater advantage than by sending men out of a country where they are wanted in summer, and in winter to consume the produce of the soil. It had been stated that the labourer was badly off; now he contended that the labourer was not so badly off as had been represented, for he had many privileges which mechanics and men in towns did not possess. He was ready to acknowledge that there were exceptions to the rule, for it must not be supposed that they were all well off; but where they saw superior and industrious labourers it would be found that they were in pretty fair condition, much more so than they were many years ago. There could be no doubt that the better land is cultivated the more labourers must be employed. There was one thing which had been advanced by Mr. Walton with regard to the landlord giving security to the tenant for unexhausted improvements and security for his capital. He thought it to be utterly impossible for a man to farm to advantage without he had security for his capital. The landlord had the opportunity of employing the surplus labourers in the winter to very great advantage; but let the farmer have a long lease, and security for his outlay, there would be no necessity for this, as the tenant could employ them himself with advantage to his landlord, and to the community at large,—for all must be aware that the cheaper an article is produced, every class of the community must be equally benefited by it. It had been stated by Mr. Parmiter that labour was a marketable commodity, and he agreed that such was the case; but he knew very well that, during the winter, when there was a great surplus in labour, people were glad to work for small wages, and when work became more plentiful they asked higher prices; and he thought it but fair that their labour should be paid for as a marketable commodity. He concurred in what had been said on the subject of education; but, with regard to King's Somborne, it would be found that the labourers were not better than those of other places. There never was a summer but

what he had numerous applications from labourers of King's Somborne for work, and he had employed them, but they were rather worse than any he could find—in fact, not one of the whole lot was worthy of the name of a labourer, notwithstanding some of them had been educated at King's Somborne school. He could not go the whole length with Mr. Walton, and thought that they were not called upon at the present meeting to pass a resolution that should be put forth as a remedy for emigration. The subject before them merely related to the effect of emigration on the agricultural interest; and their object was now to prove whether it was injurious to them or not. If they came to a resolution that it was so, then there would be fair ground for bringing the subject forward at the next meeting.

Mr. KEARSEY said that from want of education he felt himself incompetent to enter into so grave a subject as that which now engaged their attention, but he had common sense enough to know that emigration was not only injurious to all classes, but to the community at large, for he had been taught to believe that the population of a kingdom was its strength and wealth; therefore he contended that emigration was most seriously injurious to the nation at large. One thing he regretted was that Mr. Spearing had not brought forward anything by way of remedy; he fancied a remedy might be easily proposed and easily adopted. The evil of emigration originated with the bad and base Government of this country injuring that important class which had been the means of keeping those people who were leaving it. He would ask how was the land to be well cultivated without the means of doing it? The Government had deprived the farmers of the means of employing the labourers. It was impossible for a man to pay a £15 debt with a £10 note. The remedy for this state of things was in his opinion to be found in equal and just taxation of all classes of her Majesty's subjects. As an old man he would advise them to talk less about the farmers, and never remain quiet till they had obtained redress from the Government for the wrong which they have sustained—

May landlord and tenant join hand in hand,  
To take the burthens off the land—

that the British farmers may be placed on an equality with all other classes.

Mr. JAMES REEVES said the parish in which he lived having been alluded to induced him to make a few observations. With regard to the poor rates they were lower before Mr. Dawes came into the parish, and reduced from eight to four, therefore the school could not have had anything to do with it. With regard to labourers on the roads they had

some, but not so many now as formerly, which might be attributed to the improved state of agriculture, and the labourers being distributed about. With regard to emigration he did not think that at present it had produced any serious effects on agriculture, although it might probably in future.

Mr. WALTON said that the object of the discussion was to suggest a remedy to induce the labourers to stay at home, and prevent the injurious effects which must result to the agricultural interest in consequence of emigration. He perfectly agreed with Mr. Kearsay that the people, generally speaking, were the wealth of a nation; but in Wiltshire, where the poor rates pressed heavily, an excess of population was considered to be injurious. Mr. Kearsay had said that it rested with the Government to alter the present state of things—now he said it did not, for the Government had done its duty. The price of corn must be a marketable commodity the same as labour. He would not concur in any measure which would give one class an advantage over another. His object was to benefit the agricultural class, and to point out a remedy by which they would be enabled to keep the labourers at home. Mr. Walton then stated that, in a conversation with Lord Ashburton, his lordship had told him that in Devonshire he had some small tenants holding three or four acres of land, who were squatters, paying no rent, and he had been obliged in fact to pay them to go out, and the land was then thrown together in a large farm. Having observed that tenants were not to be slaves, Mr. Walton stated that some time ago he received notice to quit a farm which he had occupied for fourteen years, because he would not vote for Mr. Melville Portal. The rent of the farm was £800 a year, which he punctually paid, and probably his then landlord now regretted the step he had taken. He then contrasted the conduct of Lord Yarborough who gave security to his tenants in Lincolnshire, with that of other landlords, and contended that with nine-tenths of the evils complained of the Government had nothing to do—it was the landlord alone.

Mr. SPEARING observed that there had been a great deal of discussion; but he did not think the effects of emigration on the agricultural interest had been sufficiently considered; in fact Mr. Walton had wandered entirely from the subject. He should be sorry to think that the club would advise any labourer not to strive to better his condition; on the contrary, he should be glad to further his views by keeping him at home instead of sending him abroad. He could not think where they were to find a supply of labourers, and while the farmers were suffering for want of labourers they did not find any increase in the price of corn, although

there was an increase in the price of labour, and no reduction in the poor rates. He conceived the emigration of agricultural labourers to be injurious. With regard to what had fallen from Mr. Walton on the subject of remuneration, he believed some labourers were earning good wages. He (Mr. Spearing) had a man who, with his wife, a girl, and two boys, were now earning 22s. 6d. a week, and in the summer months had earned £2 7s. a week.

The CHAIRMAN then put the resolution, which was carried, two members expressing their dissent.

Mr. EASTON moved a vote of thanks to the Chairman, which was unanimously agreed to.

The CHAIRMAN having acknowledged the compliment, said, there was one thing on which he differed from Mr. Walton on that evening, and had on a previous occasion recommended him, if he wished to carry any object, not to use such language towards the landlords. It was ungenerous, and not at all likely to promote the interests of the tenantry, it being totally impossible to drive an Englishman, and all classes were entitled to proper respect. In this country they had as honourable and upright landed proprietors as any

in the world; and he believed that if tenants were more explicit, and laid their requests respectfully before their landlords, instead of abusing them behind their backs, they would be far more likely to have their wishes acceded to. It was well known that there were a large number of landlords in this kingdom who were not in a position to grant tenant right—for instance, look at entailed property—look at property under 21 years' lease, renewable every seven years, and copyhold and lifehold property. If they wanted justice done to them, they must endeavour to obtain it from the Legislature for the landed proprietor. All entailed property should be charged with the cost of permanent improvements, and all leasehold and copyhold should be enfranchised by the payment of a fixed annual sum, in order to enable the proprietor to do justice. He was not one of those servile men who would succumb to a landlord; still he would treat him with due respect, and make his request in a civil way; but, if not granted, he would not abuse him. In many of these cases the farmers themselves were to blame. If Mr. Walton, at a future meeting, would bring forward the subject, he would second the adoption of any plan to benefit the labouring classes, to prevent their emigration.

#### WINCHESTER FARMERS' CLUB.

The monthly meeting was held on Saturday, Nov. 27th, at the Black Swan Inn, and numerous attended. The subject for the evening's discussion was brought forward by Mr. John Twynam, on "The Covenants between Landlords and Tenants, as most conduce to their mutual interests."

The CHAIRMAN then said—Gentlemen, the subject for discussion this evening is "The Covenants between Landlords and Tenants, as most conduce to their mutual interests," upon which it is desirable we should arrive at an equitable decision. Two years since farm leases were discussed by this club, and I will call your attention to the resolution decided upon at that time, which appears very applicable to the present subject. On the 30th of November, 1850, it was—"Resolved that, by the abolition of import duties on foreign produce, the farmer is thrown into competition with all the corn-growing countries of the world, which renders it necessary that he should meet the consequent depreciation in price by increased production. That this club would give full security to the landlord against injury to his property by the tenant; but they know from experience that, from the general improved system of husbandry, a much greater extent of corn may be now grown than formerly, without in any degree impoverishing the

land. That in consequence of the present mode of framing farm leases, which usually contain restrictive covenants, limiting the tenant in his extent and mode of cultivation, he is debarred from competing fairly with the corn growers of other countries, to his own injury, and the loss of the community at large. That a lease of a stock farm should contain sufficiently stringent covenants on the part of the tenant, for securing the rent to the landlord, for guarding against the dilapidations in the buildings and fences, and against waste in general, for keeping and feeding on the land an ample stock of sheep; and providing at the end of the term a proper entry for the incoming tenant for his turnip and wheat crops, and that the tenant should then be at liberty to exercise his capital and skill in growing for his own benefit, and selling for the use of the consumer, any of the productions of the earth without restriction as to extent, quality, or kind; the landlord having sufficient guarantee against injury to his land by over cropping from the increased quantity of manure produced by a large flock of sheep, as well as from the number of acres necessarily sown with green crops to support them. That it is the opinion of this club that the lease should contain a provision for the payment to the tenant, at the expiration of

his term, of a fair and equitable sum for unexhausted improvements." If the latter part of this resolution were universally acted upon, there would not be any occasion for the outgoing tenant to exhaust the land to obtain remuneration for his outlay, therefore I firmly believe that covenants may be dispensed with; still, till that desirable time arrives, it would be well to endeavour to ascertain the best plan that can be adopted in accordance with the present time, and existing circumstances; and as the proposer of this subject is a person of extensive practical experience, I anticipate that the best that can be devised will now be presented for your consideration. I will, therefore, call upon Mr. John Twynam to favour us with his view of the subject.

Mr. TWYNAM said, as he anticipated that the subject which he was about to introduce would give rise to considerable discussion, he should not occupy time with any preliminary observations, which would be only repeating in effect what he had committed to paper. He trusted that in the evening's discussion they would prove that they were not actuated by exclusive or selfish motives, or hostility towards the landlords; on the contrary, he hoped that by the arguments which would be brought forward, that the landlords would be induced to hold out the right hand of fellowship to them, and assist them to improve the state of agriculture in this country. He had, as it were, endeavoured to put himself as a sort of arbitrator between landlord and tenant, his motive being based upon the principle of justice. Mr. Twynam then read the following paper:—It has long been a subject of just complaint that leases are burdened with a mass of unnecessary verbiage, of no possible benefit to the landlord, as regards the protection of his land, but productive of much expense and perplexity to the tenant. The same remark applies to the number and ambiguity of the covenants, the greater proportion of which are only fitted, as experience has too often proved, to discourage improvement and foster litigation; indeed, so completely are they at variance with the practice of the present day that while on all sides farmers are urged to amend their system, and to avail themselves of the discoveries of science, whereby to improve their cultivation, they are met on the very threshold of their efforts by a positive veto on advancement, imposed by the illiberal covenants which alike distinguish and disgrace the forms of ancient leases, after which our modern ones, with few exceptions, are drawn. With these facts before me, it has been my aim in the remarks I am about to offer, to compress into as small a compass as possible, consistent with a due exhibition of the import of the agreement, all covenants relating to

the course of cultivation, and to adopt such principles as the base of their foundation as shall give the tenant the fullest scope for the exercise of his skill and judgment, compatibly with due regard to the interests of the owner; I have, therefore, introduced the different objects for which it may be necessary to covenant, under separate heads, in the following order:—1st, the system of cultivation; 2nd, the disposal of the produce; 3rd, repairs; 4th, tenant's privileges and rights; 5th, the landlord's power and reservations. In discussing the nature of the covenants which appear to me to be quite sufficient to insure fair treatment to the land, I am, of course, guided by the requirements of that description of soil of which the county of Hampshire is found to consist, and to the cultivation of which I have been chiefly accustomed; any system, however, which may be deemed suitable for this county, may, with proper modifications adapted to meet local circumstances, be applied to many others, where stock feeding on arable land forms the chief feature of the agricultural economy. I commence, therefore, with the consideration of the rotation of crops. It is a common covenant in Hampshire leases, that the tenant shall not sow two white straw crops in succession; now, this, so far from being a beneficial restriction, I think I shall be able to prove, is, in many cases, positively detrimental to good farming. Take, for instance, any land, except that of the lightest chalks or downs; who, among us, has not witnessed the almost total loss of the barley crop when it has followed turnips eaten off during an adverse season—either too wet or too dry? and who has not seen effects equally disastrous, when, in order to make the swedes hold out till the grass season arrived, the seed was sown late, sometimes never vegetating at all, and at others, growing with a rapidity peculiar to vegetation on the advent of summer, and producing almost to a certainty an immense mass of straw, too weak to carry out its berry to perfection? On the other hand, if the tenant has the choice, let wheat be the first crop, then barley; a season, which is oftentimes of more consequence than the manure, will be certain of being secured; the land will have been fallowed during winter, and pulverization, so indispensable to a barley crop, easily obtained; the seed furrow will then be ready at the earliest spring, and eight or ten weeks will be afforded in which to take the advantage of the proper season, when it offers, instead of being obliged to sow, as under the present system, at the moment the food is cleared, let the weather or the soil be in ever so unsatisfactory a state; in the place of a trodden, poached soil, defying alike all the powers of the clod-crusher to reduce, and of vegetation to force the blade through

the hardened surface, you have a fine, light seed bed, both pervious to and retentive of moisture, arising from the one sound basis—a perfect cultivation—which cannot be effected where the tenant is not allowed to exercise his judgment in the rotation which he adopts. But the advantage does not stop here: the barley being followed by swedes (rye intervening, if desired), and these swedes followed by forward turnips, an incalculable benefit would be often gained in the stock department,—the feeding of the swedes could be protracted into the month of May, or even June, under pressing circumstances; an immense addition might be made to the hay crop by thus saving the feeding of young grasses; the annual bill for guano or bone dust might be reduced; for if both the swedes and the turnips were fed off on the ground, the wheat crop succeeding, the turnips would need no further manure, and the yard dung, now usually applied to the wheat crop, might be used for the swedes after the barley. I would, therefore, recommend that if any restriction be imposed on the tenant as to his method of cultivation, it should be limited to his growing *not more* than two straw crops in succession, or more than two in four years, leaving the manner of distributing the growth to his discretion. But, gentlemen, I am inclined to think the tenant might be safely left without any restriction at all, as to his sowing, if the covenants for keeping a large stock of sheep or beasts were rigidly enforced, save and except during the last two years of his tenancy, and even then, or under a holding from year to year, the present restrictions might be much modified. Sheep and cattle are the sheet-anchors of all farming in these days, and it is impossible to provide liberally for a full stock of either, and at the same time to oversow the land. I think I could in a few minutes convince any landlord willing to lend me his attention, that by one simple covenant, securing the uninterrupted feeding of a large stock on his land, he might safely dispense with that legion of restrictive, mystifying covenants which serve only as so many clogs to the skilful and energetic, or as traps, through which the unwary tenant may unwittingly get entangled in the meshes of the law. Covenants, I verily believe, were concocted in former days, when lawyers were less honest than now, with the view of increasing the charge for the lease, or to serve as a net whereby to catch their game. To proceed to the second head of our subject—the disposal of the produce. It is the opinion of many intelligent farmers that all restrictions on this point should be abolished, and that the tenant ought to be allowed to dispose of every thing he grows,—hay, straw, roots, &c., as well as corn. Now I confess that, except in localities contiguous to

towns, where rich and cheap manure is at all times easily obtainable, and where land bears a proportionably high rent, in consequence of the demand which exists for roots and green crops, I cannot admit that it would be just to the landowner to recommend the adoption of a system which, if carried out to the extent it might be under certain circumstances, would very materially damage his estate. I agree to the proposition that hay might be sold without limitation, except the growth of the last year, when the refusal ought to be given to the incoming tenant. The covenant for keeping a large stock constantly on the farm being strictly adhered to, it matters very little whether they consume hay, corn, or cake: the option of these articles, I think, should be given to the tenant. Of this the landlord may be assured, that, if the occupier of a farm with a heavy stock upon it can dispense with his hay, he must of necessity have previously ensured heavy crops of turnips, raised by expensive manures, or large quantities of cake or corn either have been or must be purchased; in either case a heavy outlay of money is involved, and equity seems to require that, if the tenant has the opportunity of purchasing comparatively low-priced commodities, whereby he is enabled to sustain the fertility of his farm equally with the use of a higher-priced article which he produces, he should be allowed to substitute the one for the other. But it is another question, when the modification of existing restrictions is carried out to an unlimited, undefined extent. Hay, it has been shown, can be dispensed with, and therefore the right of selling cannot be exercised without immediate supply of the equivalent—extra crops of green food, cake, or corn. But, to sell the straw or root crops (unless in the exceptional cases before alluded to) would be an illustration of the old adage, of “cutting up the goose to obtain her eggs;” it would be destroying the very foundation you have laid for the future superstructure of your system, and no artificial manures you can purchase can supply the elements of nutrition to the succeeding corn crops in anything like the quantity, or of half so permanent a nature, as those afforded by these vegetable fertilizers; and nothing but the sure return and inexhaustible supply of manure composed entirely of these ingredients can justify the sale of straw and root crops, even in the immediate vicinity of large towns. But there is another objection to this unlimited privilege, perhaps of still greater importance. A landlord, notwithstanding all his precaution, may get hold of a tenant who may become embarrassed. Capital—or money, as our forefathers would have called it—is of the feathered tribe, and sometimes taketh to itself wings, and flies away, even from the most



cautious and apparently secure. Let us for the moment assume such a case. The tenant has the power to dispose of all his produce: he manages, by the sale of his corn and stock, to meet his landlord and tithe-owner at Michaelmas, but he finds himself suddenly called on by some inexorable creditor to pay a debt, possibly under circumstances which will admit of no delay; all other available produce failing to realise the money due, the creditor proceeds to sell the straw, roots, &c.—for, I believe, the legal gentlemen will tell you that what the tenant can do his creditor can do—the landlord, remember, is paid; there is no more rent due for half a year; therefore, he has no power to interfere. An unprincipled tenant might connive at this work of destruction; the sum to be realised by such produce would be sometimes very large and tempting, and the desolation inflicted on the farm almost irreparable. Even if covenants existed binding the tenant to bring back certain quantities of artificials in exchange, it may readily be conceived that it would scarcely answer a landlord's purpose to attempt to put such covenant in force against a man deprived of all his property. Therefore, with all deference to those who hold the opinion that the taking a farm is purely a commercial transaction, and that the hirer of it ought to be as completely unfettered as the trader who buys a ship-load of merchandise, I would simply suggest that, while our best endeavours are directed to remove all oppressive and injurious restrictions on the tenant by all legitimate means, we take care not to recommend any measures for the accomplishment of such object, which can only be carried out at the expense of justice to the landlord. Thirdly, we come to the question of repairs. It appears to me to be the far preferable plan that both the labour and materials should be found by the landlord, in fact, that all repairs should be done by him; such an obligation would of course be considered in estimating the rent, yet it would remove the source of those constantly occurring scenes of strife, and sometimes ruinous litigation, between the two parties, arising from the question of dilapidations. A conscientious farmer may, like most men with a clear conscience, rest quite calm and contented under a sense that he has done his duty, that he has performed to the letter all required of him by his lease or agreement; but, poor easy soul! he forgets that justice is not always a household deity of this age—the carved images of gain and advantage are far more conspicuous idols of our worship; and if, by any neglect or oversight on his part, he lays himself open to the grasp of either of these last-mentioned powers, he will be a lucky man if they do not claim him as a victim. We all know that at the expiration of a

tenancy a surveyor is usually sent by the landlord or his agent to report on the state of the repairs. This surveyor, in most cases, is totally ignorant of the state the premises were in at the commencement of the holding, or under what covenants they have been managed during the term—his duty is simply to report as he finds them. It often happens the tenant either disputes his liability to perform the work in the manner and at the cost awarded by the surveyor, a difference arises, and after much bickering and exhibition of ill feeling, an arbitration is decided on, with what results most tenants can bear witness, to their great disappointment, but always attended with serious expense, let the issue be what it may. Aware, from these facts, of the disadvantageous position the tenant is placed in by the present system of undertaking the repairs himself, I would strongly recommend that they be thrown upon the landlord, who could then perform them to his own satisfaction, and free the tenant from the interference of those unwelcome and expensive intruders, the lawyers and valuers. But, in this case, one thing would be especially necessary, indeed equally so when the tenant is only bound to do the labour: a covenant should be introduced into all leases or agreements, limiting the time within which such repairs, after due notice given to the landlord, should be completed; or in the case of labour being found by the tenant, within which the materials should be supplied; in default of either of which, the tenant should be at liberty both to find the material and perform the work, deducting the whole cost thereof out of the half-year's rent then next accruing after the completion of the said repairs. Gentlemen, I feel there is nothing more than simple justice to the tenant in a provision of this nature, for the cases where landlords do effectually and timely execute the repairs, or supply the materials, are, or rather, perhaps, in past days, have been the exceptions, and not the rule; that a new light is dawning upon the young generation of landlords, I am willing to acknowledge; many of them, like their tenants, have "put their shoulders to the wheel," and nobly done their best to stem the torrent of destruction which legislative acts of wrong and robbery have let loose on the whole agricultural interest. But there are amongst landlords, as we are told there are amongst tenants, "men of the old school, bigoted to the ways of their fathers;" and having been witness to many cases of cruel hardship to the tenants, under a long lease, from the palpable neglect of landlords in putting the premises in repair at the beginning of a term, or of supplying the requisite materials when demanded, although under special covenant to do so, and knowing that the present remedy is no other than

a costly action at law, which few tenants have the pecuniary means of undertaking, and still fewer, if they value the peaceable holding of their farm, would venture to prosecute against a landlord, I have thought it not an unprofitable occupation of your time in thus going somewhat lengthily, and I fear tediously, into an explanation of the reasons why I recommend the shorter, and, I trust, more equitable remedy for an evil, important in its nature, as its existence is undeniable. I now pass on to the consideration of what may be termed the tenant's privileges and rights—not indeed very generally recognised as such at present, but which, I trust, may yet be taken into favourable notice, and become ranked among the established customs of the county; and I have no hesitation in declaring that the class of society to which I have attached myself, the land surveyors and valuers, are wanting in those duties the public has a right to expect of them, so long as they neglect, upon every fitting occasion, strongly to recommend to all landlords the adoption of such a measure of tenant right or indemnity as shall secure to the outgoing tenants full compensation for, at least, all unexhausted purchased manures which may be left in the land on quitting, and a fair allowance for all extra work which can be proved to be of permanent benefit to the farm. Every surveyor must be as fully aware as we are that a well matured measure of this description would be of the first importance to the tenant, and, at the same time, of undeniable benefit to the landlord and the country at large; and there is no reason to doubt, were the arguments in its favour fairly and calmly urged on the landowners by those whose duty it is to advise them on the value of their land and the nature of the covenants necessary for its proper usage, that this much desired boon would be shortly obtained. But what are the *privileges* as distinguished from the *rights* of the tenantry? Amongst them we find the liberty to remove the crowds of timber trees which exhaust the soil, and shade the growing crops, thus encouraging sprouting in wet harvests, and harbouring swarms of pilfering birds; to grub up hedgerows where numerous, or by their size occupying too much of the acreage, which are often the nurseries of weeds, insects, and vermin—another prolific source of damage to the farmer; to have the power of keeping down within the bounds of moderation, at least, the unwinged game, which often swells the quantity of live stock to be maintained beyond the capabilities of the land; these are privileges which many landlords have of late accorded to their tenantry, and it would be well to recommend them for general adoption. Highly desirable, however, as these privileges are, they must ever be considered as standing second in im-

portance to the question of tenant right or indemnity. The want of security for the return of invested capital operates on all farms with an effect equally baneful—it encourages the mischievous system of sweating down to “feather weight” land which previous good management has brought into good condition; it robs the community of a vast annual amount of produce, which would be returned regularly if the soil were preserved in an undeviating state of fertility; and it is surprising many landlords cannot be brought to see, that in a permanently reduced rent, or in a serious allowance out of the first year's payment, they indirectly sacrifice more to a new tenant than they would have to pay the old one, for leaving the farm in a high state of cultivation, under the system of indemnity, with this plain difference—that the former is never returned, while the amount of compensation would be gladly repaid by the incomer. After the calmest consideration of this much vexed question, and deliberately weighing all the arguments *pro* and *con*, I can come to no other conclusion than that every landlord whose estate is under his own controul, exhibits a want of judgment in opposing it; and that where special circumstances prevent his concurrence, the legislature ought forthwith to provide means for their removal. We arrive now at the last stage of our discussion—the rights and reservations of the landlord, which it may be necessary to secure by special covenants. Under this head may be classed the privilege of inspecting the condition of the farm during the term of occupation; the right of re-entry for breach of covenant; and the much disputed point, the power of distraining for rent. In regard to the first privilege, I consider it one which the landlord may very properly reserve, to be exercised at his discretion without any other limitation than that it be done at seasonable times, without damage, let, or hindrance to the occupier; it is necessary to his own security, and to which no honest tenant can offer any solid objection. With respect to the second point, I consider no forfeiture of the tenancy ought to ensue for the breach of any covenant where money can make compensation for the damage done; nor, as at present, should this power avail in cases of bankruptcy or insolvency. Surely, misfortune, or reverses, against which, even “the discoveries of science,” or “shouldering the wheel,” whatever wondrous feats they may enable farmers to perform in the way of cultivation, have, as yet, provided no remedy, ought not to preclude a man, or his creditors, from reaping the benefit of his labours merely because he is the victim of the common lot of humanity! the more especially as no damage need accrue to the landlord, whose covenants of protection to his land would be equally

binding on the assignees as on the bankrupt. I am aware it may be pleaded, that under the system of "tenant right," the tenant would receive compensation; to a certain extent, if the lease were properly drawn, he would; but I hold no system of tenant right, likely to meet the concurrence of the landed gentry, would secure a good farmer the full benefit of his labours if thus suddenly called on to relinquish his tenancy. Case—Waste, which the tenant might be unable to repair, or the non-payment of the monied compensation deemed as damages for the breach of any covenant, should alone form the exceptional cases in which the power of re-entry might be exercised. Cases have occurred where great injustice has been inflicted on tenants who may have broken some covenant of trivial import, lying concealed amidst a forest of technical phrases, and mystified by legal formalities they probably had never read, or if reading, failed to comprehend; in all such cases justice would be satisfied by stipulating that the landlord should demand such damages as he may be advised were incurred; and if the tenant thought the amount too high, each party should have the power of calling in his surveyor, and they the usual umpire, in cases of necessity. Last in order comes the question of distraint, a subject much agitated of late, and on which much diversity of opinion exists. I have given the best attention, not only to the arguments I have heard advanced by many able members of this club, but also to the opinions expressed at other farmers' clubs and agricultural gatherings, and am obliged to declare that, as yet, I am unable to discover any advantage to be derived from the abandonment of this privilege; and although I am aware my sentiments on this question are at variance with those of many highly valued friends, I trust they will bear with me while I endeavour to justify them. It will, I think, be conceded, that if the power of distraint were abolished, landlords would require first-rate security, as a guarantee for the payment of rent, and the due performance of the covenants the hirers of their farms might have entered into. This must be the first and certain consequence. What is the next suggestion which presents itself? Why, that the surety would himself require security from the tenant of the most stringent nature; who, in these circumstances, would be satisfied with anything less potent than a bond in judgment, or a bill of sale on the whole stock? Does any gentleman here contend that any friend becoming security for the fulfilment of so important an undertaking as the payment of rent, and due observance of the covenants attached to a large farm, would be justified in accepting a less sweeping power over the property of the secured than that which either of

these formidable instruments would invest him with? And if this be the case, what have you effected by the change but the transfer of power from the hands of landlords (who, if they do not relish any actual abatements, are generally found considerate enough to give time for payment), to those of a friend, or probably a money lender, either of whom, the one from occurrences not dreamt of at the time of the engagement, the other from distrust, when low prices or adverse seasons temporarily embarrass you, may pounce down on your farm, sweep away your property, blasting your reputation by the act, and perhaps crippling your energies for ever? This, gentlemen, is the true character of the change you would make, in so far as respects the tenant. Can you point out to me any countervailing benefits derived by the public? Certainly the general creditors of a man would be in no better position while he was under the fetters of a bond or bill of sale, than while under the mercies of a distress for rent. One, or either, is equally all-powerful, to the exclusion of all other claimants, until its demands are satisfied. I am told the present system encourages an undue competition for land. The number of competitors, I am free to confess, would be reduced by the transfer of the present power from the landlord to the tenant's surety; but of what class are the competitors you would exclude? Not the most mischievous ones—the rich tradesman or manufacturer, seeking relaxation, country sport, or the healthful exercise which farming affords; nor the reckless adventurers of the schools of science; these would carry on the mad and ruinous strife with undiminished energy, for they could get security. Not so the genuine legitimate farmer, he who has "whistled at the plough," whose "grandfather lived on his honour's estate;" he who has been beat and broken, but perhaps not completely prostrated by the foul blow of free trade; who is, indeed, putting his shoulder to the wheel, but who, as has been elsewhere well observed, requires the landlord to hold up the shafts, to go first, to guide the waggon, while he is pushing round the wheel; who, by that generous assistance and forbearance, which can be hoped for only from his landlord, may yet struggle through the difficulties a sudden and cruel policy has inflicted on him. This man, gentlemen, belongs to the class you would shut out from competition, by abolishing the law of distraint, and substituting a power which, while it would consign three-fourths of the old English farmers to penury or exile, would be unaccompanied by one single redeeming benefit, for your competition would remain fierce as ever between the parties with whom it first originated, and who, in very truth, are alone to be blamed for its existence,

viz., the rich aspirants for rural enjoyments, or the deluded followers of a false theory. Such, gentlemen, are the consequences I anticipate, if the landlord is to be deprived of a power which, I am well aware, has been much spoken against, but I fear without due reflection; and for myself I will say, if I am to be placed at the mercy of any creditor, let it be one of the old aristocracy; but save me from the clutches of the Jew or the modern capitalist. I have now brought to a close my observations upon what I consider to be the leading general covenants between landlord and tenant. I am fully sensible that I have opened a large field for discussion, and possibly for objection; but I am equally persuaded that your knowledge will correct the errors into which I may have fallen, and your experience supply the deficiencies which may be apparent. I trust both the members of this club, and gentlemen out of doors who may be interested in the affairs of agriculture, will do me the justice of believing, that in offering these my suggestions on a subject so vitally affecting the onward progress of this first of sciences, I am endeavouring to secure to the tenant full scope for the exercise of his skill and enterprise, and a safe investment for his capital, neither of which, I am bound to say, is at present afforded him; and that, in perfect compatibility with this possession of these great desiderata, I would reserve to the landlord that wholesome supervision of his property necessary to insure its proper cultivation; continue to him a paramount claim for the recovery of his rent, and protect him in the enjoyment of those privileges to which, as owner of the soil, he is indisputably entitled.

Mr. Twynam, on concluding, read, *pro formâ* the resolutions, which are given at the close of the report.

Mr. W. STRATTON said, after the very able manner in which Mr. Twynam had brought forward a most important subject, it might appear singular in him to oppose it. He concurred in some of the observations which that gentleman had made, and in others he did not. He would not attempt to follow him through all the details, because he could not recollect them. With respect to what had been stated by him relating to the cultivation of the soil on the four-field system, he perfectly agreed with him that a tenant ought not to be bound down to sow barley after swedes. He ought to be beyond the reach of controul, and at perfect liberty to lay out his capital in what manner he pleased. With such a bond about his neck the tenant became something more worthless than the meanest bailiff. He supplied all the general wants, while, if the crop should fail, he became the sufferer, and no one else. The tenant farmer ab-

sorbed his capital to pay his rent, and other expenses; therefore the system to which Mr. Twynam had alluded was perfectly right. He thought that a tenant should not sow more than two wheat crops in succession, but with regard to two white straw crops he disagreed with him; because in this county they could do better on the four-field system. With respect to what had been observed on the subject of building and repairs, the landlord doing all the labour, he thought was perfectly correct. When he took his farm the landlord was not bound to do it; but he liberally did so. It was better, however, to take a stipulated portion in the shape of rent: then there would be no squabbling between landlord and tenant; for sometimes the tenant had to complain that the repairs were not done. To remedy this Mr. Twynam proposed that the tenant should do them, and deduct the expenses from his rent. With regard to the system of tenant right, or tenant indemnity, as Mr. Twynam had been pleased to call it, he did not see why its name should be changed. If it was a tenant right, let it be called tenant right, and by no other name, and let it not be said that they had forgotten it. Had not the landlords' rights?—why then should the tenants not have theirs? He hoped that they would assert the system of tenant right, which it was quite as much the interest of the community at large and of every inhabitant of the empire to uphold. With regard to the law of distraint, he knew very well that, after what had fallen from a man like Mr. Twynam, of unimpeachable character, who had thoroughly considered the subject, it might seem wrong for an humble individual like himself to dispute such an authority; still, without intending any disrespect to him, he would boldly declare in that room, that to be called upon to find sureties, and to give bonds in judgment, would greatly impede, if not destroy the tenantry of England. He thought that landlords had rights by law which were wrong in justice. They had their rights secured to them by their rents being paid quarterly, and the tenant was bound to pay, and in default an execution might be put on his property. He thought that if the laws of restraint were rescinded, the effect would be to bring land to its more legitimate value than it was at present. If a landlord called on a tenant to find sureties for the payment of his rent, the latter went to his nearest friend, who was generally a man of business, and if not, he sent some one to ascertain whether there was any chance of realising his expenses from the rent of the farm. If the person so sent believed the rent asked to be too much, or greater than the applicant could afford to lay out, he advised him to give it up, and told him that under such circumstances he declined to be his

surety; the farm then would be open to the public. Generally speaking, farmers and valuers knew pretty well the value of land, therefore he believed it would be let at its legitimate, and not at its superficial value, as at present. Mr. Twynam had said that he would rather be under the old aristocracy than under the Jews, and he (Mr. S.) thought so too; but the best plan to be secure was on the tenant right principle—that the landlord should have his rent, and no more; then the land would realise its legitimate value. He defied any farmer to say that he had paid his expenses within the last fourteen or fifteen years; therefore, if the produce would not meet the expenditure, there must be something wrong in the system. He hoped he should live long enough to see the law of distraint abolished, when landlord and tenant could meet each other on equitable and amicable terms.

Mr. CUNDELL said he could not refrain from making an observation or two on the very interesting subject which had been brought forward that evening by Mr. Twynam. That gentleman had remarked that vegetable produce might be advantageously sold near large towns, by being replaced with manure. If that were the case, he did not see why it should not do so at a distance; for if the principle was good in the one case, it was equally so in the other. All that they wanted was to go upon the broad principle of farming. They used their best endeavours to get a living on their farms, and if one thing did not succeed they tried something else. With respect to leases, he thought all restrictive covenants ought to be abolished, and that they should be allowed to farm as they liked, and grow what they could. They all knew that in most of their leases they were restricted from growing only a certain quantity of wheat, without any allowance for adverse seasons. Now he should like to know how that was to be done this year, when not half an average crop had been grown, and next season they might have the opportunity of growing an abundance, but were restricted from doing so in consequence of these vexatious covenants. With regard to the law of distraint, he could not agree with Mr. Twynam, as it gave an undue preference to landlords over the creditors, and under its operation men with false capital were accepted as tenants, in order that landlords might obtain a large rent.

Mr. T. S. GODWIN said he quite agreed with Mr. Twynam in the former part of his proposition, with respect to cropping the land, and thought his recommendation exceedingly good, in order that the tenant should have an opportunity of exercising his skill and ability in any way he thought proper. Then as to the subject of what was called tenant right, he conceived it was a misnomer, and thought

it ought to be termed landlords' advantage. Every tenant who went to take a farm, of course he inquired what were the conditions to which he was to be subject, and unless he found he could not enter upon it in the usual way, he would say it was not worth so much; but if he had to pay for unexhausted manure he would be charged more, on the principle of an insurance, say £20 a year for the term. This capital was paid by the tenant to the landlord, to be returned at the expiration of the term. A landlord, let him be ever so bigoted, could not fail to be convinced that this arrangement must be for his own benefit, because he had actually been paid the money beforehand, which he was subsequently called upon to return. He very much questioned if this arrangement was to the tenant's interests, because he must first of all find out what were the precise sums to be given by him for the improvements alleged to have been made. The community no doubt would be benefited by the increased produce, and all parties would reap the advantage by the adoption of the system; but the question was whether the tenant would be adequately remunerated to the extent of his outlay. At the present moment the statute law of this country did not acknowledge any other property in the soil except the landowner of the soil; therefore, if Mr. Twynam took this fact into consideration, he probably might be inclined to think it would be judicious to abolish the law of distraint. He thanked Mr. Stratton for the suggestions he had made, because they called in other persons in addition to those who came to the land.

The CHAIRMAN considered that they were greatly obliged to Mr. Twynam for the very able manner in which he had brought the subject before the club. They must all be fully convinced that, to insure good cultivation, the farmers must be left free with respect to that part of the subject introduced by Mr. Twynam, relating to leases. On referring to the report of a meeting of the club held about two years ago, it would be found that Mr. William Pain had said that there should be "a covenant in the lease for keeping an ample stock of sheep, and to provide a proper entry at the end of the term for turnip and wheat ley. The tenant should then be at liberty to exercise his skill and capital to the best advantage, without restriction as to sowing, either in extent or kind of crops; because the landlord would have a sufficient guarantee that his land could not be over-cropped if a large stock of sheep were kept on it." He believed that all would concur in opinion that a man must be left free to exercise his skill and ability to the best advantage, and not be bound down by any vexatious or illiberal covenants. If a landlord was secured by a certain amount of live stock being

left on the land, he thought all covenants should be cancelled, and if there was sufficient for the incoming tenant, that was all a landlord need require. At the present time, unless the farmer exerted his skill and energy to the utmost, it was impossible for him to continue his occupation; therefore men ought not to be prevented from producing the largest crops at the least cost: and in order to do this every tenant must have security for his outlay, and no man would be able to do justice to himself unless he held his farm on the basis of tenant right. Mr. Godwin had very much enlightened him on this subject. He saw no reason why landlords should object to give that security, and, in his opinion, it was the fault of the farmers that they did not have it. The farmers had no greater enemies than those of their own class. He knew of no system which would tend more to promote a good feeling between landlord and tenant than that of tenant right. He recollected that at the opening of the Docks at Grimsby, when Prince Albert was on a visit to the Earl of Yarborough, at Brocklesby Hall, in Lincolnshire, the whole of his lordship's tenantry, as a mark of respect to their landlord, voluntarily turned out as an escort to his Royal Highness, mounted on horses said to be worth from 100 to 200 guineas each. They had security for their outlay, and thence arose their attachment and respect for their landlord. Nothing, he believed, tended more to promote good feeling amongst the landed interest than that those above should do justice to those beneath them. He knew that there was an ill-feeling among the labourers towards the farmers, to whom they looked for employment. The farmer knew his position, and the risk he would run by increasing his outlay; therefore he declined to employ more labourers, although he did not tell them the reason. This was the cause why labourers were so much set against their masters. If the system of tenant right were generally established throughout the country, the community at large would be benefited, and it would have the effect of bringing back the land to the same state as it was formerly. He knew of nothing better than granting to the tenant security at the time of quitting; and unless they obtained this, farmers' clubs and other things were worthless; but when this was established on a firm basis, farmers' clubs, fat stock shows, and other agricultural meetings, could not be too numerous. But the rearing of fat stock was a very great expense and loss to the farmer, whose only remuneration was to be patted on the shoulder by his landlord. He trusted, however, that the time had arrived when the farmers would think for themselves. His object was to lead and not to drive; and he wished to convince the landlords

that it was their interest to grant tenant right. He wished to perpetuate a good feeling among all classes in the country, and they should unite together for the benefit of the whole. With regard to the last clause in Mr. Twynam's resolutions, he would suggest that, as a resolution on the subject of an opposite tendency had been passed at a former meeting, whether it would be wise to pass another to contradict it. He would, therefore, with Mr. Twynam's consent, propose that the last clause should be withdrawn. His own impression with regard to repairs was, that as the tenant was on the spot, he was the fittest person to attend to them, more especially as in very many cases the landlord might reside a hundred miles distant. If the tenant undertook to do the repairs, he was the most likely person to keep the premises in good order. He wished to do justice between landlord and tenant, for it was well known that landlords generally were not men of business—it was more likely that farmers would know how to get repairs done most advantageously.

Mr. TWYNAM replied at some length, and expressed his willingness to withdraw the resolution alluded to by the Chairman, as he was not aware that the club had come to any resolution on the law of distraint. With regard to the question of security, he would say that a man might not have any other capital than the capital of skill and industry, who, by the operation of this system, would be shut out of the firm. With respect to the remark made by the Chairman, that repairs had better be done by those occupying the premises, he admitted that it would be much better; and, in proof of this, adduced an instance where a tenant had applied to his landlord to get repairs done within a certain time; they were partly done, and the tenant suffered much, for the landlord dying before his occupation ceased, the new landlord brought him a bill to the amount of £500 for dilapidations.

The CHAIRMAN then read the following resolutions, as amended, and they were unanimously agreed to:—

Resolved.—1. That, in the opinion of this club, the covenants generally introduced into leases, prescribing a certain course of cropping, are injurious to their operation, and act as insurmountable obstacles to the full development of the skill and judgment of the farmer, and to the prosecution of the improved system of agriculture;—that the most important object to the landlord is to secure a large stock of cattle and sheep on his land, and this being attained, no specific covenants as to the mode of cultivation are necessary, except such as shall provide for a proper entry to the person who may succeed the present tenant.

2. That as a general rule, the spending of the green crops on the premises being provided for, the tenant might safely be allowed to dispose of all other produce, without restriction: but, in particular localities, the disposal of all produce might be permitted.

3. That, with the view of encouraging every measure which may prevent collision between landlord and tenant, this club is of opinion that all repairs should be wholly performed by the landlord, but, in case of his neglect to give timely attention to them, after due notice, then it should be competent for the tenant to undertake the same, and to deduct the cost, both of materials and labour, from the next payment of rent.

4. That the agriculture of the kingdom generally would be much benefited if the timber surrounding arable land were felled, and hedgerows reduced into a moderate compass, and that it would be only a measure of justice to the tenantry, if the privilege of destroying hares and rabbits were accorded them.

5. That the adoption of tenant right, perhaps better described as tenant indemnity, is absolutely *indispensable* for sustaining agriculture in the state of improvement already effected, and encouraging its future progression, and this club desires hereby to record its solemn conviction that the system of farming will never arrive at that point of perfection it is capable of attaining, without its general acknowledgment in all contracts between landlord and tenant.

6. That the breach of any covenant by a tenant should be remedied, where practicable, by a moiety compensation; and, if thus provided for, the right of re-entry, the present penalty, should be abolished; that the landlord and his agent should enjoy the right of supervising the farm, at all convenient times during the tenancy.

Mr. SPEARING proposed a vote of thanks to Mr. Twynam, for the able manner in which he had brought the subject forward.

Mr. COLLIS seconded the motion, which was carried unanimously, and Mr. Twynam made a suitable acknowledgment.

Mr. T. EARLE moved a vote of thanks to the Chairman, for the great ability which he had displayed on this and other occasions.

Mr. T. S. GODWIN seconded the resolution, which was unanimously agreed to.

The CHAIRMAN said it would give him infinite pleasure on all occasions to endeavour to promote the advancement of a class to which he belonged. His only aim was to benefit his brother farmers, and to point out to them the system which they ought to adopt in order to insure success, and he should feel most happy if his feeble attempt should

have the effect of placing them in a better position than they ever had been. He trusted that the discussions of the club would always be conducted so as to tend to promote a good feeling among the landed interest, for he was sure that people of every class were easier to lead than to drive. He returned his most sincere thanks for the vote of approbation which they had been pleased to pass on his feeble services, and hoped that they should prosper in future, and that the meetings would be more fully attended.—The members then separated.

TITHE COMMUTATION.

SIR,—As your agricultural, as well as clerical, readers may feel anxious to know the result of the corn averages for the seven years to Christmas last, published in the *London Gazette* of this evening, viz.—

	s.	d.	
Wheat . . . . .	6	0½	per imperial bushel.
Barley . . . . .	3	9½	„
Oats . . . . .	2	6¾	„

I beg to state, for their information, that each £100 of tithe rentcharge will, for the year 1853, amount to £91 13s. 5¾d., which is a reduction of more than 2 per cent. from last year's value.

The following statement from my *Annual Tithe Commutation Tables* will show the worth of £100 of tithe rentcharge for each year since the passing of the Tithe Commutation Act, viz.—

	£	s.	d.
For the year 1837 . . . . .	98	13	9¾
— 1838 . . . . .	97	7	11
— 1839 . . . . .	95	7	9
— 1840 . . . . .	98	15	9½
— 1841 . . . . .	102	12	5½
— 1842 . . . . .	105	8	2¼
— 1843 . . . . .	105	12	2¼
— 1844 . . . . .	104	3	5½
— 1845 . . . . .	103	17	11¼
— 1846 . . . . .	102	17	8¾
— 1847 . . . . .	99	18	10½
— 1848 . . . . .	102	1	0
— 1849 . . . . .	100	3	7¼
— 1850 . . . . .	98	16	10
— 1851 . . . . .	96	11	4¾
— 1852 . . . . .	93	16	11¼
— 1853 . . . . .	91	13	5¾
	171	£1,697	19 4½

General average for 17 years . . . . . 99 17 7¼

I am, sir, your most obedient servant,  
CHARLES M. WILlich.

25, Suffolk-street, Pall Mall East, Jan. 7.

SALE OF IRISH BEET SUGAR.—A further sale of Irish beet sugar took place last week, at the offices of Mr. John Stokes, Commercial-buildings, in Dublin. It was manufactured by the Mountmellick Company. The quality was excellent, and the prices of the lots, comprising sixty-seven bags, ranged from 41s. 6d. to 45s. 6d. per cwt.

THE DETAILS OF AN EXPERIMENT ON RAISING POTATOES, IN THE YEAR 1852.

BY H. H. EASTMAN, OF MARSHALL, ONEIDA COUNTY, N. Y.

We give the very interesting and valuable experiments made by H. H. Eastman, of Marshall, Oneida County, N. Y., which have been undertaken in consequence of the premiums offered by the Society. Mr. Eastman will continue his experiments next season, and we anticipate important results from the experiments which shall be made.

The various experiments.	Different rows in each experiment, relatively.	Weight of seed.	Condition of seed when used.	With and without manure and how applied.	Quantity of manure used.	Push.		Remarks.
						lbs. oz.	produce per acre.	
Different Manure, in the hill, and no manure	No manure	6 0	Whole potato	No manure	—	61 12	166	Smooth and good sizes.
	Hog manure	6 0	do.	in the hill	Half shovel full in each hill	100 12	271	Some rough spots, good.
	Equal quantities of bog manure, ashes, lime and gypsum	6 0	do.	do.	Handful in each hill	60 12	163	Smooth and good sizes.
	Long unfermented manure	6 0	do.	do.	do.	75 12	203	Quite rough, good sizes.
Fermented or rotted manure	Compost	6 0	do.	do.	Two-thirds shovel full in each hill	77 12	209	Smooth, good sizes.
	In the hill	6 0	One whole potato in hill	do.	Two-thirds shovel full in each hill	78 12	211	Some rough spots.
	On top of hill when planted	6 0	do.	Top of hill	do.	68 0	183	Smooth.
	In hill	6 0	One whole potato in hill	do.	do.	85 4	229	Uniform in size, large and fine.
Manure of fowls	In hill	6 0	One whole potato in hill	do.	Large handful to each hill	64 12	174	Small and poor quality.
	Top of hill at planting	6 0	do.	Top of hill	do.	59 3	159	—
	In hill	6 0	One whole potato	do.	Handful to each hill	51 3	146	—
	Top of hill	6 0	do.	Top of hill when up.	do.	52 8	141	—
	In hill	6 0	One whole potato	do.	Half handful to each hill	63 8	144	—
	Top of hill	6 0	do.	Top of hill when up.	do.	60 8	162	—
	In hill	6 0	One whole in hill	do.	Tablespoonful in each hill	53 0	156	—
	After up	6 0	do.	Top of hill when up.	do.	53 0	142	Large, uniform in size, and good.
Early, medium, and late planting; soil gravely loam	Planted 18th May	6 0	One whole potato in each hill	No manure	—	49 0	131	Smaller, uniform, and fair.
	Planted 23rd May	6 0	do.	do.	—	37 8	100	Quite small and unmarketable, unfit for the table.
	Planted 8th June	6 0	do.	do.	—	80 0	215	Large, uniform in size, good quality.
Large, medium, and small potatoes for seed	Large	12 4	One whole in hill	do.	—	50 8	135	Smaller, uniform in size, and good.
	Medium	6 0	do.	do.	—	43 8	117	Very small, inferior & unmarketable.
	Small	3 7	do.	do.	—	51 0	138	Very small and unmarketable.
	Small	6 14	Two whole in hill	do.	—	63 0	167	Very small and unmarketable.



Large potatoes, cut and uncut, for seed	Large .....	10	6	One whole in each hill	do.	.....	71	8	192	Large, uniform in size, and good. Little smaller, but good and marketable.
	Large, halved .....	10	6	Two halves in each hill	do.	.....	81	0	217	
	Large, halved .....	5	3	One half in each hill	do.	.....	52	0	139	
	Large, quartered .....	9	0	Four quarters in each hill	do.	.....	58	0	156	
Sulphur and no sulphur planting; soil manure	Sulphur, after potatoes are up .....	6	0	One whole in each hill	After up .....	Teaspoonful to each hill	44	0	116	Poor quality.
	No sulphur .....	6	0	do.	After up .....	Teaspoonful to each hill	52	3	140	Fair quality.
Salt-petre and no salt-petre	Salt-petre, after potatoes are up .....	6	0	One whole in each hill	After up .....	Teaspoonful to each hill	52	0	139	Fair quality.
	No salt-petre .....	6	0	do.	Top of hill after potatoes up	One tablespoonful to each hill	53	8	143	Fair quality.
Gypsum .....	Top of the hill after up .....	6	0	One whole potato in each hill	do.	.....	58	0	156	Uniform in size, and good quality.
	No gypsum .....	6	0	do.	do.	.....	48	0	130	Smaller in size, and quality not so good.
Early, medium, and late planting; soil manure	Planted 18th May .....	6	0	Whole potato in each hill	do.	.....	74	0	201	Large and good quality.
	Planted 28th May .....	6	0	do.	do.	.....	67	0	182	Smaller and poor quality.
Compost and fresh or unfermented manure, in the hill, and spread broadcast upon the surface	Planted 10th June .....	6	0	do.	do.	.....	56	0	147	Small and unmarketable.
	Compost, in the hill; 5 rows, 5 hills in the row, three feet apart forming a square .....	6	0	One whole potato in each hill	Compost or rotten manure, in hill	Two-thirds shovel full in each hill	73	0	200	Potatoes good size, exterior rough and worm eaten.
	Compost, spread broadcast, on the surface; 5 rows, 5 hills in the row, square .....	6	0	do.	Compost or rotten manure spread broadcast on surface	An equal quantity with that in hill	59	12	159	Good size, smooth, and good quality.
	Long or unfermented manure in hill; 5 rows, 5 hills in the row, forming a square .....	6	0	do.	Unfermented manure in hill	Two-thirds shovel full in each hill	83	8	224	Good fair size, rough exterior, and some worm eaten.
Compost and fresh or unfermented manure, in the hill, and spread broadcast upon the surface	Long or unfermented manure spread broadcast, on the surface; 5 rows, 5 hills in the row, forming a square .....	6	0	do.	Unfermented manure spread broadcast on surface	An equal quantity with that in hill	91	4	245	Large, fine, uniform in size, and good quality.

The ground upon which the above experiment was tried was greensward, ploughed early in the spring, nine inches deep; soil gravelly loam, except as otherwise stated. Planted 18th of May, except as otherwise stated. Hoed twice—first 18th of June, second about two weeks after. The cultivation was intended to be as nearly alike as possible. Taken from the ground as soon as the vines were dead, which was not till killed by frost. All the rows, except as otherwise stated, consisted of thirty hills each, three feet apart each way. All the potatoes were free from the rot. The kind of potatoes planted was the red potato, which here goes by the name of "Irish Lunkers."

—From the Journal of the New York State Agricultural Society.

## CROYDON FARMERS' CLUB.

The monthly meeting took place on Saturday, Dec. 18th, 1852, when Jonas Cressingham, Esq., in the absence of the chairman of the club, who was unable to attend from indisposition, was unanimously called upon to preside. The subject for discussion, which was "On the Application of Machinery to Agricultural Purposes," was ably introduced by Mr. Walker, of Addington, who has for some time past had a steam engine erected on his farm. The subject brought together a good muster of members.

Mr. WALKER said: Mr. Chairman and Members, the subject I have been called on to introduce to this club is a most important one, and requires great discrimination and judgment and practical knowledge, to show its importance, and the advantages to be reaped from having properly-managed machinery and implements properly constructed to suit the work they are intended for. I think every member—nay, every farmer in England—ought seriously, and at once, to take this subject into consideration, as low prices in corn have not produced cheap labour, as was anticipated; and not only that, but our best labourers are emigrating rapidly, and, to all appearance, the tide of emigration is likely to continue. Our laws also are now framed and settled upon the principle of unrestricted competition, and upon that principle, as laid down by government, every sensible man will look out for the cheapest method of carrying out his plans. If by machinery labour can be to a considerable extent displaced and quicker done, and if by the introduction of lighter and quite as effectual implements we can save something considerable in horse-power, as well as in the displacement of one-third of the hands that have hitherto been kept to attend to, and go with the horses, we shall have established something worth our meeting here. Gentlemen, in entering into this subject, should I differ in opinion with a majority of the members of this club, I can only say I am giving you my own convictions, founded on practice, and should any member feel any doubt as to the practicability of what I may assert, I shall be most happy to give him proof of my assertions on my own farm. I will first speak of machinery. I say, every farmer who has 300 acres of tillage land, lying together, so as all to come to one yard, ought to have a small fixed steam engine, thrashing machine, mill stones, chaff cutter, circular saw, and steaming tubs—not only on account of the great saving of expense in performing these several operations, but for the independence it gives him into the bargain, in taking advantage of the markets for both corn and labour. In referring to what such machinery will do, I shall confine myself to what we ourselves do, and not to what might be done. We thrash about 4 quarters of wheat per hour, 4 qrs. of barley, and 10 qrs. of oats; shake the straw clean and winnow the corn well out of the chaff, and thrumble barley. It will perform all this much better than can be done by hand. It would require three women to loose sheaves, a man to serve the machine, one to drive the engine, and one woman to throw the corn from the winnowing machine into the corn bin; or, if two, they turn it through the hand machine which cleans it. The number of hands employed to take straw away depends how far it has to be carried, and whether it is tied or not. I generally employ four Irish women, who tie it with one hand, and carry it into a straw barn or stack it. In either case a man stacks or mows it. The Irish women have 8d. per day, and

the men 1s. In grinding we average 19 qrs. per hour of barley or wheat, and cut one load of chaff at the same time, besides bruising oats and splitting beans at the rate of 5 qrs. per hour. The engine requires from 7 cwt. to 8 cwt. of small coal for 12 hours' work, at 6d. per cwt., cost price at Croydon. By the circular saw, two of my men will saw more in six hours, than they will in 12 days by hand. The steaming is done with the spare steam, at dinner time and night. The cost of all this machinery, without buildings, would be about £250 to £300, all fixed complete. What I have stated I am regularly practising, and I find the economy and convenience very great. Combining the whole of my produce at one price, the cost of thrashing, winnowing it once over, thrubbling the barley, and tying the straw with one hand, does not exceed 6d. per qr. Should this seem extraordinary to any one whom I am addressing, let him remember I have engaged to prove practically what I assert. Some farmers to whom I have talked about having machinery on their farms have answered, "It may do very well for you who understand it, but I could not manage it." Now, gentlemen, I think this no reason at all. Why should I know better about machinery than any experienced farmer in this room? I was not brought up to any such business, nor had I any experience in the making of any implements till the year 1840, when I entered upon a large tillage farm in Yorkshire; I then engaged a blacksmith, a young lad who had just finished his apprenticeship, to do my work on the farm at 6s. per week, which same young man I have at present. I found, to get on, there required all the improvements I could suggest, for I paid £900 a year rent and tithes for 446 acres of land; I therefore say, it was necessity that urged me to see that my implements and machinery were constructed so as to do the most work at the least cost; and from my own ideas, gathered from observation, and what I gleaned at our shows of implements, &c., I got so much credit in the county I left (for the improvements I had introduced) that my neighbours and friends presented me with a very handsome silver tea service when I removed in 1847. This shows plainly that "necessity is the mother of invention," or I should never have been addressing this meeting on the advantage of machinery. I have merely introduced this anecdote of myself to show that all may understand this subject if determined; and I think it is a very essential part of a farmer's business to know the most economical machinery and implements he may require, without which he must go at random to work. My plan, it will be thought by most tenant-farmers, involve a great outlay from the estimate I have given; but, if they could see the great saving—the independence connected with being able to do all at home in the way of grinding, thrashing, sawing, steaming, &c.—they would never be satisfied till they had obtained the same advantages. If landlords would fix such a set of machinery on all large farms, instead of returning a per centage, it might answer their purpose, and give the tenant the advantages I have described, which would be much better than a return of rent. To tenants on small farms, I would recommend a fixed machine, to thrash, winnow, &c. (as I have before described), with a pulley outside the barn, to attach a portable engine to, at each farm-house. And, providing a landlord had six or eight small farms in the same neighbourhood, there might be one portable engine to move from place to place, as it was required. If that could not be

done (though I think it might, if properly applied for), the only course would be for the tenants to join for the purchase of an engine. It would be better, however, to allow the landlord a per centage, which would prevent the locking up of their own capital, if they could not well spare it. In this neighbourhood, my friend Stavelay can manage that for a number of his neighbours, as soon as they see the advantage of his assistance. Gentlemen, I will not occupy your time longer upon machinery, but will now say a few words with respect to implements. I think the plough the leading implement; I will, therefore, take that first. When I first came into this neighbourhood to look at the farm I now hold, I thought the large turnrise plough, with four horses and two men, which I saw creeping at work in light land, completely outrageous to all common sense. After having had every opportunity of judging of the merits of these large ploughs, I think them as ridiculous an implement for light thin land, as it would be to have a waggon to ride to market in. Very steep hill-sides would be the only places I could reconcile myself to their use—as there is a much more profitable and more economical plough, which is adapted for either strong or light land. I will give you an illustration of my views and my reasons for coming to this conclusion. When I came here from Yorkshire, I brought some of my small iron ploughs, which answered well there; but when put amongst the Surrey flints, they did not face them to my satisfaction. I then saw no alternative for the present time but to go to the turnrise, which I did very reluctantly, on account of the quantity of horses and men required to go with them; and I found in practice it was a most expensive job to what I had been used to, or what I thought ought to be necessary. Under these circumstances, my mind was daily anxiously at work to throw this huge plough overboard—not on account of its work, but the expense of working it. In my researches I fortunately got acquainted with Mr. Russell, of Horton-Kirby, and in going over his farm he was using Howard's plough, which did its work well. He told me he had always used turnrise ploughs, and was prejudiced in their favour over all others; but, after a fair trial of Howard's plough, he thought they did their work quite as well or better, and the saving of horse power was so great that he did not then use the turnrise at all. I was talking to his son, Mr. Robert Russell, about the merits of these ploughs, when he offered to send a man and plough over to my house (which is 15 miles) and plough the best turnrise plough I had. I had just got a new one of the first principle, a very good one. I had a man, Jack, who ploughed with it, and thought himself first-rate. I mentioned this challenge to Jack, who very eagerly accepted it. I accordingly wrote to Mr. Russell to accept the challenge; when he came, and brought his man and plough with him. This was just what I wanted. It was in July, and they were to plough in the worst ploughing I had. I put them into a piece that had not been broken up, the land very dry and flinty. Jack, with half a hundred weight at each end of his plough for ballast, went with a full determination to be master; but Mr. Russell's man did not seem daunted without ballast. They had not been many rounds before Jack went to peep at what his antagonist was doing. I let them go on some time before I asked Jack what he thought of it, when he said he was beat; the Howard's were better ploughs than turnrise. I encouraged him, but it was of no use. That was the very thing that I wanted; I got Jack beat, and all the prejudice beaten out of him, as well as the rest of my men. I set to work at once and altered my Yorkshire iron ploughs to Howard's principle, and got some of Howard's, which I am using now with two or three horses, as the land is for draught, and the depth I wish to have

it ploughed. I never use more than three horses abreast driven by reins, by one lad. By this means I save one man and one horse in every team, and often two horses. Every lad has three horses to take care of, and I never get so much done by two men with the turnrise and four horses, nor so well done on the average. I use iron harrows, which are driven by one lad, with reins. We have them for two, three, or four horses working abreast, according to the weight of harrow required. They have also the advantage of lifting the harrows when required. In my opinion they are very superior to wood, being much more effective with the same power employed. As to drills for corn, I have seen nothing better than one I have by Hensman and Son, of Bedford, which presses the coulter in by a lever. For turnips I like my own manure drill best, on account of the large quantity of compost I can drill with the seed. I also like my own horse rake and hoe best. I forgot to state, when speaking of machinery, that I think Hornby's winnowing machine best. I also wish to mention that steam power does not require food when not at work, like extra horses on a farm. I will now trespass no longer upon your time; but, gentlemen, however unsatisfactorily I may have introduced this subject to your notice, you have it honestly to the best of my abilities, and as free from prejudice as any person can judge of his own feelings. And I think you will agree with me that I have shown to this club the practicability of producing farm produce at much less cost, on account of the great saving effected by machinery properly arranged, and implements properly constructed to suit the purpose they are intended for. In conclusion, I beg to remind this club there is nothing secret in my statements—all can see who choose.

At the conclusion of Mr. Walker's address,

The CHAIRMAN said he thought Mr. Walker had shown, in a most satisfactory manner, that he was a considerable saver by the application of machinery on his farm—that he accomplished more than he could possibly do by common labour at a much less cost, which, especially in the existing state of agriculture, were two very important points. He quite coincided with Mr. Walker as to the desirability of machinery being introduced upon large farms by the landlords, and also by the smaller ones, which might be accomplished, when a number of small farms lay contiguous, by erecting an engine in as central a position as possible, for the service of all.

The VICE-CHAIRMAN (Mr. Rowland): By the tenants paying a per-centage for the outlay.

The CHAIRMAN: Just so. The safest way to test a theory was by taking the experience of a practical man—a man who could speak, as Mr. Walker had done, from experience. In such a case, the truth became irresistible, and he believed no one would attempt to doubt the results which had been pointed out to them.

Mr. CHASEMORE thought that too much importance could not be attached to the subject of the application of machinery. Events were continually transpiring which showed the necessity of reducing the cost of production within the smallest possible limits; for it was now fully evident the farmer must rely entirely upon his own exertions in the great battle of competition (Hear).

Mr. CHURCHER said he had been to Mr. Walker's farm, and had seen his machinery in operation; and he returned with the perfect conviction that it must be the means of effecting a considerable saving. He (Mr. Churcher) had tried hand-labour, and afterwards machinery worked by horses; but no doubt was left on his mind that the same description of work could be done much cheaper by the application of steam. Still, there was a great outlay of capital; and that was a point which he thought Mr. Walker had not sufficiently

referred to, though, even when the cost of machinery and buildings was taken into consideration, he really believed the steam machine would have the advantage in thrashing.

Mr. WALKER said, he was some time ago asked to put up a machine for a tenant farmer, for which he was to pay 10 per cent. With such a machine he would engage to thrash 80 qrs. per day.

Mr. CHURCHER was quite convinced there would be a saving of £100 on a farm of 600 acres by the application of steam machinery, or at the rate of 3s. 4d. an acre; and if the landlords, instead of reducing rent, would erect machinery for their tenants, they would indeed be doing them a good service. Mr. Walker, in that respect, enjoyed a most favourable position—a position they would all be glad to enjoy. Mr. Walker had another advantage; he was enabled to employ Irish labourers, while he (Mr. Churcher) had to pay as much for the work of nine men as Mr. Walker had for the work of twelve. On such a farm as he had mentioned, that was another great saving (Hear). It was a saving of which Mr. Walker had a right to avail himself, and was a source of economy to which they might all be compelled to resort; he could not help thinking it was bringing down their labourers to the condition of mere serfs.

A MEMBER.—We have nothing to do with it.

Mr. CHURCHER said, he was looking at the broad view of the question, and to what might possibly occur. If the peasantry were our country's pride, such a course would assuredly act to their degeneracy—it would, as he had said, bring them down to the level of foreign serfs.

A MEMBER.—Labour is rising.

Mr. CHURCHER wished to show that Mr. Walker possessed great advantages. This machinery enabled him to employ men (and women too), whom they, whether they were disposed or not, could not employ to the same profit. Mr. Walker had a good landlord, and his position, taking all sources of saving into account, was better than that of any other person occupying a similar farm, by £300 or £400 a year. There was one point to which he intended previously to allude on the subject of thrashing, which was somewhat in favour of hand-labour of horse-power, which was, that they got the chaff and straw better. There was not the same degree of waste. On some farms, where it was used as litter, it was not of much moment, but on others it was. On the whole, he was quite satisfied that steam machinery might be introduced to great advantage.

Mr. WALKER wished to state, in reference to what had been said about his position, that his landlord only put up his buildings.

Mr. CHURCHER—He perhaps did them cheap. Mr. Churcher then said a few words in reference to ploughs. He regarded Ransome's turnrise as the best for side hills and flinty ground, and Howard's round plough for light land and level ground, as being more economical through the light draught, and consequent saving of horse-power.

The CHAIRMAN thought the subject of steam machinery might be considered further with great advantage. It was of the greatest importance; and he was surprised it had not created more general attention.

Mr. J. K. ROBINSON thought the question might be viewed in two lights, and both had been alluded to. One was the philanthropic (urged by Mr. Churcher) and the other, the practical (introduced by Mr. Walker). The farmer was driven to the use of machinery, and the employment of Irish, thus reducing the English labourer to a state of serfdom, by the free-traders who were the most complete set of political swindlers that ever existed. The farmers would be compelled, as a matter of necessity, to adopt a system of reduction; they had nothing left to do but to look to themselves. They were

told, if they consented to free-trade, they would soon have a repeal of the malt-tax, but what was the fact? How had the free-traders acted? The men who had been tried at Newgate for obtaining money under false pretences had never acted with greater dishonesty (Hear, hear). Those men (the free-traders) were the parties who had put the farmers in the position in which they were at present placed, and left them in these difficulties. It was what they might have expected. Mr. Cobden, the great Mr. Cobden, never had one idea beyond himself; all he did was to promote the interest of "I, Richard Cobden." Self must also be their principle of action, however repugnant it might be to their feelings. He believed that Mr. Churcher and many others would rather advance than diminish the price of labour, if they could. But it was impossible; they must now act for themselves. That was his view of the case. His feelings went with the philanthropic view of the question as to what ought to be, but with the practical as to what must be. There was no alternative, for the swindling free-traders would do all they could to sink them to the lowest possible depth.

Mr. WALKER said, that he kept a few top men to whom he, perhaps, gave better wages than Mr. Churcher did, and to the others he gave cottage room and fuel free. The Irish people behaved well, and generally attended the Church or Roman Catholic chapel on a Sunday. With his machinery a large number of first-rate hands was rendered unnecessary.

Mr. E. STENNING thought the members of the club were much indebted to Mr. Walker for introducing the subject of machinery to their notice. He had been much pleased on the previous day to witness Mr. Walker's machinery at work; and after paying particular attention to the way in which he was carrying it on, he (Mr. Stenning) felt that if he had the same amount of land, he should like to be in Mr. Walker's position. (Hear.) It was of the highest importance to get the landlords to assist in the introduction of proper machinery into farms; but, unfortunately, there were not many like the one Mr. Walker had. No farmer would object to pay a reasonable per centage for the use of such machinery on his farm, but he (Mr. Stenning) saw a difficulty in having machinery taken round to a number of farms. They had not such great landlords in that part of the country as there were in some counties; otherwise, the difficulty might be lessened. Mr. Walker had a great advantage over his neighbours with reference to his farm buildings; they were altogether, and his stock was altogether, which was of great importance. He also, during his visit, saw the women at work employed by Mr. Walker, and he must say they worked like men. (Laughter).

A MEMBER—"The master's eye was upon them." (Renewed laughter).

Mr. STENNING had also seen Mr. Walker's ploughs at work with three horses, but the land was of that nature that he thought it might have been ploughed with two. He could not quite understand the necessity for four horses, except in very particular instances. He was generally in favour of two-horse ploughs where the nature of the land would allow it, and that, of course, must always be their guide. He was also in favour of turnrise ploughs for steep hills. In speaking of Mr. Walker's buildings, he had not mentioned that they were all supplied with shoots; there were no drippings, and a constant supply of water was secured. He thought Mr. Walker's thrashing machine was quite equal to his description of it, as were also his wood-sawing and chaff-cutting machines. He saw several deals cut with great expedition, and machinery for sawing must be of great utility on a large farm. His machinery had without doubt secured to him most important advantages; and he repeated, that they were all much indebted to Mr. Walker for bringing the subject forward.

Mr. CHURCHER inquired the price of putting up a sawing apparatus (supposing an engine on the premises).

Mr. WALKER said, he would engage to put one up complete for £10.

The CHAIRMAN said, that he believed the use of machinery worked by steam had not been introduced into any other country, and it was only introduced in England to enable the farmers to carry on the competition with foreigners. By it hand-labour must in a great measure be superseded.

A MEMBER.—The usual implements of farming used in foreign countries are of the rudest character.

The CHAIRMAN continued: Machinery had been invented, and the question therefore was, would they not be compelled to adopt it, or whether, under all circumstances, it was not advisable (Hear).

Mr. STENNING thought the main question was, how they were to get it. He was afraid there was no hope of such a thing till half the farmers had been driven out of the country, and the land was thrown back into the hands of the landlords. Then, there might be a chance.

Mr. WALKER said, there was evidently a misapprehension as to the price of putting up an engine. It did not require so much capital as some might imagine; and there was such a saving in connection with an engine, that any farmer who had the means would be a gainer by having one erected.

Mr. STENNING said that, some time ago, when he paid a visit to the estate of a noble lord, he asked a question which at the time he was afraid might be considered impertinent. It was with reference to the price of an engine which was shown to him. The question was whether it cost more than £300, and he was informed that it cost more than £800; therefore it was impossible for them, as tenant-farmers, to obtain the benefit of one for themselves.

Mr. WALKER said, it was not unlikely the cost included the building; but if they used horse machines, they wanted a building to put them in, and very little more room was required for an engine. He could do the work of all Surrey in the building on his farm.

Mr. STENNING—You only make us regret we have not the same advantage (laughter).

Mr. WALKER continued—He would fix for any gentleman similar machinery to his own for £300.

Mr. CHURCHER said, that Mr. Walker's landlord had laid out about £2,000, on which (as we understood) he only charged £25 additional rent. They could not expect every landlord to do the same.

Mr. WALKER was not disposed to deny the advantages he possessed; but if he had only a barn he would have had a chimney put in at one end and a steam engine erected. It was quite safe, and he would as soon put straw in his engine-house as anywhere else.

In answer to a question, Mr. WALKER said, the extra insurance only amounted to about one per cent.

The CHAIRMAN believed Mr. Stavelly had a steam engine, and he should be glad to hear what he had to say.

Mr. STAVELEY said he could do nothing more than simply corroborate the statements of Mr. Walker, who had entered fully on the subject. He believed there was quite a saving of £200 a year. With reference to what had been said as to reducing the labourers to serfs, he could not agree with some of the observations made. The saving of labour was capital, and it was an absurdity to adhere to old implements when others could be had. As to hand-flails, he believed there would not be one to be found unless it was in the antiquity department of the British Museum (laughter).

The VICE-CHAIRMAN thought Mr. Walker was entitled to a vote of thanks for bringing the subject before them; whereupon

Mr. T. FARLEY rose to act upon the suggestion. Mr. Walker had consented at his request to bring forward the subject, and for the manner in which he had done so he certainly concurred with Mr. Rowland that he was entitled to their thanks. Indeed, notwithstanding what had been said, he (Mr. Farley) considered he was the true philanthropist. Mr. Farley then complained of the remarks of Mr. Robinson, which were calculated to produce a political discussion, and if he understood rightly politics were contrary to rule.

Mr. STENNING said there was no rule to prevent a discussion of political questions affecting the interests of agriculture, but the subject must be properly introduced. But if Mr. Farley considered the remarks of Mr. Robinson irrelevant to the question under discussion he might have called him to order.

The motion was seconded and carried unanimously.

## MR. BUSHE'S TURNIP GRATER.

### OBSERVATIONS ON THE FEEDING OF CATTLE.

The mode of feeding cattle generally, in this country, is very objectionable, being wasteful, while, under a more economic and systematic arrangement, a greater number of cattle may be fed on the same amount of provender, thereby yielding a greater profit and a larger amount of more valuable manure, which is of such vast importance on a farm.

Hay, straw, turnips, and mangel, are the chief source of supply to feed cattle during winter and spring, and these are usually dealt out to them, the hay as it comes from the rick, the straw as it comes from the barn, and the roots as they come from the field, except being cut in slices: they are given in proportions of each kind, which they eat separately, usually, until they can eat no more, while that which is rejected too often falls back into the litter, and becomes part of their bed.

I consider that, under a judicious arrangement, the use of so much hay may be dispensed with, as we find that, in parts of England and Scotland (the Lothians), farmers having large farms have no more than one or two acres of hay (as they say for a pet horse or a sick animal); but straw and turnips form the basis of their food for animals. Hay I look on as an expensive provender, as you usually appropriate the best grass field you have to the production of hay, which is sometimes a difficult crop to save in humid weather, and you deteriorate that portion of land as much as if it yielded a grain or root crop; whereas, if continued in pasture, it would support more growing cattle in proportion than the other lands on the farm.

I now mean to give my views and practice in the economic use of straw and turnip, and with turnip I

include other crops, if on the farm, such as mangel or carrots. Straw, whether of wheat, barley, or oats, when well husbanded, becomes wholesome good food for animals; but in conjunction with turnip, &c., will keep them in good condition, while the addition of bean-meal, corn, or oil-cake, will make them fat. I have long entertained the opinion that nearly all the straw on a farm ought to be converted into chaff, and, also, the turnips cut into small particles, and mixed as food for cows, horses, and sheep. The difficulty that presented itself to me was, to get an efficient machine for this purpose, that, by manual labour (in the absence of water or steam power) would cut the straw and turnip expeditiously and well. A few years ago I saw, at the national cattle show, held in Derry, Richmond and Co.'s (of Salford, near Manchester) No. 5 chaff-cutting machine, and ordered one; and I have no hesitation in pronouncing it one of the best ever invented; as three girls (two turning and one feeding it) will cut with ease one cwt. of hay into chaff, half an inch long, in fourteen minutes. This, for ten hours, gives two tons cut in the day, and forty minutes over to remove the chaff; and at fourpence per day to each girl, is sixpence per ton for cutting hay or straw into chaff. The machine is made, by an easy change, to cut three different lengths, and cuts furze admirably for horses, &c., one-eighth of an inch long. I was next at a loss for a turnip-cutting machine, to shred the turnips into fine particles, and was fortunate to find one lately made by Mr. Bushe, of Glencairn Abbey, in the county of Waterford; and I have also no hesitation in pronouncing it one of the most valuable and efficient machines yet ever invented (in conjunction with the above) for economizing and preparing food for feeding cattle. It cuts the turnip into thin shreds, half an inch broad, by one-eighth to one-sixteenth thick, and with precision and rapidity. Two girls turning and one feeding will cut twenty cwt. in an hour. Being provided with two such machines, I recommend the admixture of chaff and shred turnip, to vary in proportion in the one or the other, according to the de-

scription of cattle they are intended for, viz., if for young growing stock, less turnip and more chaff; if for incalf or milking cows, more turnip, mangel, or carrot, and less chaff; and so on with fattening cattle, horses, and sheep. When intermixed (which is easily done by using a fork with four prongs), let it remain in a heap for three or four days, when it will ferment, thereby become artificially prepared for the stomach and digestive organs of the animal, immediately to receive and assimilate the food to advantage. Thus you can convert all your straw, in conjunction with turnip, &c., into a wholesome, nutritious food, given systematically, by measure, to each animal, in a trough or box before it, without any of it being lost or wasted. It may be said, What will be done for litter or bedding in the cow-house if all the straw be consumed? If no substitute can be found on the farm, boards form an excellent bed for cattle to lie on.

Since I purchased this machine from Mr. Bushe (which no farmer growing turnips ought to be without), I have been feeding twenty-four fattening pigs on shredded Swedish turnips, put into tubs for three or four days, when they have fermented, and become quite warm, as if steamed, and sweet. A small hole being made in the bottom of each tub as the fermentation arises, the superfluous waste in the turnip escapes and flows off, thereby making it more substantial as food. In addition to this, I allow each pig some bruised oats: they eat it with avidity, and by this means I save the expense of fuel. I am next testing this plan in the feeding of ninety sheep in house, and I have no doubt as to the result.

I make these observations merely with the view of inducing others to try the admixture of varieties of food; and from my own success as far as I have gone, I cannot foresee the extent to which economy may be carried in the successful feeding of cattle.

BARRY DREW.

*Flower Hill, County of Waterford.*  
—*Irish Farmer's Gazette.*

## OBSERVATIONS ON THE WEATHER.

By J. TOWERS, Agr. Chem., &c.

I was greatly struck, on perusing the article entitled "Meteorology," in the *Mark Lane Express* of Jan. 4, by the following remarks of the writer. Mr. H. White observes:—

"The past ten days have been replete with great barometric fluctuations, and storms of wind and rain that have extended the whole length and breadth of the United Kingdom, doing a great amount of mischief among trees, fences, chimneys, roofs of houses, &c., while the rains have again filled some of the rivers, and caused them to overflow their banks, and to lay much land under water. The mildness, too, is as remarkable as the storms, and forcibly reminds us of the winter of 1821, which followed a wet summer and autumn. In November and December of that year upwards of 9½ inches of rain fell. November, and December too, were remarkable for storms of wind and rain, like the two corresponding months of

this year. In 1821, every little rill became a powerful stream, as they have done this year, so that in both cases low grounds and marshes resembled seas and large lakes, while in 1821 and the present year (1852) there was an almost entire absence of frost. The fields now, as in 1821, present the splendid verdure of a fine but protracted autumn. Many of our garden favourites are still in bloom; geraniums still in the ground are as fresh as they were in early autumn (some of which are still in bloom). During both years 1821 and 1852, although the nights have been wet and boisterous, and drenching showers during the days, yet at intervals we have had some lovely sunny days, with the thermometer ranging between 40 and 55 degrees. In November, 1821, it reached 63 degrees!"

In order to justify Mr. White's observations, and also to extend the comparison of years, I add that in 1821 I resided at St. Peter's, Isle of Thanet, and retrace the

mildness of the winter, which was proved by the floral beauties of the garden, that comprised nearly if not quite a dozen of specimens, whose names I registered at the time, though I regret to have subsequently lost the lists. Among those flowers were the beautiful but shy double polyanthus in great perfection, China roses, &c., &c. In that favoured locality—the soil resting upon a vast chalk rock—water and flood could not remain unabsorbed; we observed, however, the amazing quantities of penetrating rain that fell everywhere. But the most awful phenomenon (characteristic of the neighbourhood) was displayed at Ramsgate harbour, into which 700 or 800 vessels were driven, at all hazards, by the fury of one of the tornados of that peculiar winter.

There are many persons, constitutionally timid or over-sensitive, who are apt to take a gloomy view of every occurrence of somewhat irregular character. To such the foregoing statements may be useful; and, for the same tranquillizing purpose, I refer to the Rev. Gilbert White's *Summary of the Weather*, as I find it in the early edition of his "Natural History of Selborne." This summary commences with the year 1768. *That* and the three following years do not materially assist our purpose, but from the account of 1772 I extract the following lines:—"From the middle of August to the end of September, rain, with storms and thunder. To December 22nd, rain, with mild weather. December 23rd, the first ice seen; to the end of the month, cold, foggy weather.—1774. After the harvest, to the 24th of August, sultry, with thunder and occasional showers. To the end of the third week in November, rain, with frequent intervals of sunny weather. To the end of December, dark, dripping fogs: and thence, in 1775, to the end of the first fortnight in March, rain almost every day. To the first week in April, cold winds, with showers of rain and snow."

1782. In this year the table *rain-gauges* commences, and there I find the greatest fall on record.—"Selborne stands in a sheltered spot: the air is soft, but rather moist, from the effluvia of so many trees. The quantity of rain that falls on it is *very considerable*, as may be supposed in so woody and mountainous a district." In this year the average of the twelve months was 50 in. 26½ c. Now, the mean of nine entire years was, by the table, 41 in. 76 c. The bulk of rain in this said year fell chiefly after January, 4 in. 64 c.; namely, in March, 6 in. 54 c.; April, 4 in. 57 c.; July, 7 in. 9 c.; August, 8 in. 28 c.; and September, 3 in. 72 c. The autumn then became dry. It does not, therefore, meet the object we have in view, otherwise than as it stands opposed to the average of the year 1788, namely, 22 in. 50 c., and thus proves, by direct tabular estimates, that in the *same locality* mutations of the most startling character may take place. The years 1789 and 1791 represent more closely the quantity of rain that has fallen in 1852 than any others in the table. Thus in 1789—June, 4 in. 24 c.; July, 3 in.

62 c.; September, 2 in. 82 c.; October, 5 in. 4 c.; November, 3 in. 67 c.; December, 4 in. 62 c.: total of the year, 42 inches. In 1791—July, 5 in. 56 c.; September, 0 in. 73 c.; October, 6 in. 49 c.; *November*, 8 in. 16 c.; December, 4 in. 93 c.: total of the *three last months*, 19 in. 58 c., followed in January, 1792, by 6 in. 73 c. of rain!

The land *must* have been flooded in all the low grounds and river valleys. Have we not in these records consolatory evidences that variations and fluctuations of a startling character are of frequent occurrence, and should not be regarded as prognostics of evil?

As chastenings—instructive monitions—such perplexing events may be safely considered "blessings in disguise;" and in proof of this, we may appeal to the almost total failure of the potato in Ireland, and the subsequent continuance of its disease during seven consecutive seasons. Have we not thus been taught that the potato-tuber (with its seven-eighths of water—its small portion of starch, and its mere unit of nitrogen, if any), cannot safely be made the chief food of man? But not further to digress. I come at once to the period when my own observation of facts may tend to corroborate the evidence of others. My earliest recollection of an autumnal saturation of the ground is referred to 1791. Before the end of December, however, the rains had ceased; and were followed, prior to Christmas-day, by first a deep fall of snow, and then by a frost so severe and persistent, that, for many weeks (the supply-pipes in London being frozen) many persons were constrained to obtain the house-supply of water from the fire-plugs of the streets. Our laboratory in Clerkenwell thus obtained the water required, by the men conveying it in buckets from a temporary pool which they formed by damming up a central gutter. The above fact gives some force to Gilbert White's remark that "Intense frosts seldom take place till the earth is perfectly glutted and chilled with water, and the springs are high: the terrible long frosts, as in 1739-40, set in after a rainy season." But at present (Jan. 7) the land is, and has long been glutted, and the rain is at this moment "flushing the saturated ground; yet there has been scarcely an hour of frost, a film of ice, or a flake of snow, and coincidentally with a temperature of 7 degrees *above* the general average of December. The year 1799 was disastrous throughout: the hay and corn crops being nearly destroyed; the water standing almost knee-deep in the month of September. This desolation caused the advance of bread in 1800 to 1s. 10½d. and 2s. the quarter loaf; although *that* year was one of the most sunny and hot seasons on record. Not, however, to multiply examples, having already alluded to the floods of 1821, it is only necessary to observe that in my table of November and half of December, 1839, I read—"The volume of rain reminds us of the extremely wet and mild winter of 1821." And again—"The latter weeks have been generally mild, with prevalence of wet, the lowlands are flooded, more so perhaps than in 1821." Again, on

the 5th of February, 1840—"Floods are general, owing to the late profuse showers; 7th, Quite wet; 8th, Shower; 15, Profuse rain came on at noon." That winter remained *mild* till the *equinox of March*, 1840, when a permanent improvement was indicated. Snow

had scarcely been observed. Numbers of examples could be referred to, all proving that there "is no rule without an exception," "that what *hath* been *shall* be," and "that there is no new thing under the sun." *Croydon, Jan. 7.*

### PUBLIC DINNER AT RHUDDLAN TO SOLER WATKIN, ESQ.

Soler Watkin, Esq., the highly respected agent of W. S. Conwy, Esq., having relinquished the agency of the Bodrhyddan Estates, on his appointment to the superintendance of the estates of Kinnel, the tenantry, with whom he had been usefully and honourably connected for the last five years, deemed it a fitting occasion to testify in a public manner the respect and esteem which they entertained, as well of his private worth as his public character. In consequence of this feeling on the part of Mr. Conwy's tenantry, and other gentlemen desirous of marking their approval of his integrity and worth, a meeting was held, at which it was determined to give him a public dinner, and to present him with a testimonial expressive of their approbation and regard. Accordingly on the 30th ult. about 140 gentlemen, chiefly tenant farmers, and others residing in towns adjacent to the Bodrhyddan estates, sat down to a most substantial repast, prepared for them by the worthy landlord of the Marsh Inn, Rhuddlan. The room was tastefully decorated with various species of evergreens, interspersed with flowers, and surmounted by appropriate mottoes and devices relative to the occasion. In the unavoidable absence of W. S. Conwy, Esq., the Hon. R. T. Rowley presided. The Rev. J. W. Edwards, vicar of Rhuddlan, occupied the vice-chair, when the toast of the evening, "Their guest, Soler Watkin," was given amid tremendous cheering.

Mr. WATKIN (who on rising was received with several rounds of applause) said that had he been endowed with powers of the highest order of eloquence, he could not possibly express the feelings of gratitude that animated his bosom on that occasion. For the very handsome and flattering manner in which his health had been proposed by the honourable chairman, and for the warm and cordial manner in which it had been responded to by the company, he begged each and all to accept his grateful thanks. He begged most sincerely to assure them that he was altogether inadequate to express the overflowing feelings of his heart. It was the proudest and happiest moment of his life, and the kind token of their esteem and regard which they had that evening presented him with would be treasured by him as long as he lived. During his five years' connexion with the Bodrhyddan estate it had always been his aim and endeavour to act impartially between the landlord and tenantry, and he had the proud satisfaction of knowing that his endeavours had not been in vain (cheers). Difficulties had presented themselves in his path, but he had boldly taken the bull by the horns, and succeeded in making all right (cheers). The agricultural interest had been greatly depressed, but he trusted that they had reached the end of adversity, if he might so express himself, and that their future course would be more

prosperous. He begged again to thank them most sincerely for their kindness, which he had assured them would be indelibly impressed on his memory (vehement cheering).

The following address, beautifully engrossed, was presented to Mr. Watkin:—

#### "TO SOLER WATKIN, ESQ.

"We, the undersigned, tenants of W. S. Conwy, Esq., cannot allow the occasion of your departure from amongst us to pass by, without giving public expression to the sentiments entertained towards you by the inhabitants of your neighbourhood.

"We desire to express our respect for you as an exponent of the truth, that, while an upright and conscientious discharge of duty is in every position and rank of life the surest path to honour and reputation, in an agent it is the means by which the esteem and regard of the tenantry may be secured without any forfeiture of the confidence of the landlord.

"While we beg to offer you our warm congratulations upon your appointment to a position of increased emolument, and one in which your energies and influence will be extended to a wider sphere of usefulness, we cannot but express our regret at the termination of a connexion which has now for five years continued with no small advantage to ourselves, and as we would fain hope, with a degree of satisfaction to yourself.

"You will leave behind many happy impressions upon those with whom you have engaged in the intercourse of business or society; you and your family will take with you the good wishes and kindly feelings of those amongst whom you have lived.

"May your future office be distinguished by as many satisfactory and pleasurable associations as that you have now relinquished, and which the proceedings of this day conclude.

"JOHN ROBERTS, Aberkinsey.

JOHN JONES, Marsh Inn.

WILLIAM ROBERTS, Pen-y-fiordd.

JOHN HUGHES, Morfo-cwybr.

JOHN ROBERTS, Dwyilig.

EDWARD ELLIS, Rhydyddaiddwr.

JOHN HUGHES, Pendre, Dyserth.

CORNELIUS EDWARDS, Pen-y-bryd.

ROBERT JONES, Rhyddorwy Wen.

WILLIAM WYNN, Croekiu.

ROGER JONES, Cwyher-bach.

ROBERT ROBERTS, Llewellyd."



THE EFFECTS OF THE HEAVY RAINS IN 1852 UPON  
LANDLORD AND TENANT IN 1853.

What effect will the present extraordinary weather have upon the agriculture of the future? How will the incessant rains we have had affect the prospects of the farmer in 1853? These are questions which the tremendous quantities that have fallen naturally suggest. The facts of the case are almost without parallel. We have heard of flood, and destruction of property—not confined to one or two weeks, but almost continuous over a succession of months. Now on a more rigid scrutiny, a really scientific appreciation, the fall is still more extraordinary. The annual average falls of rain are, for a long succession of years, about two inches per month, or twenty-four inches and a fraction per annum. For the last quarter of a century we have never yet had in one year a fall of 29 inches; while the lowest amount has been only 16 $\frac{3}{4}$  inches. The fall of the month of November during that period was 4 $\frac{1}{2}$  inches; and recently we seem to have been reducing our annual and monthly average somewhat considerably; the amount last year being little more than half-an-inch, and the average fall for 25 years in November will not be more than one inch and a-half. In the past month it has been six inches and one-fifth;\* while the two preceding months were also so rainy that they have swelled the account of a previously somewhat dry average to a total fall up to the end of November of 30 $\frac{1}{2}$  inches. This is unequalled, we believe; nor do we think that, with one exception, in any month in any year since the commencement of the present century has there been so much rain—though in 1804 it was approached within half-an-inch.

More, therefore, falls per day, per month, and per annum, than experience will afford us a parallel almost in a century; the land being literally saturated with wet.

Had it not been for the drainage, now happily so general, the land would have been even more saturated than it is; but the drains have rapidly carried the water away, and aided perhaps a little the floods of the lowlands. But on many clay soils the sowing is utterly out of the question. Neither horse nor implement can come upon the land. And where the corn has been sown, the water has so extensively covered the soil that the seed has had only that partial access of air, and that excess of water, that it is to be feared it has in many cases rotted in the ground.

\* At Bowness it has been nearly *ten inches*.

These are, however, only the particular and incidental influences of the rains in certain localities. There are general and very important results calculated to flow from a state of things so new—so truly remarkable,

It is well-known that evaporation is one of the great means of reducing temperature. It is this which is used to produce artificial ice in the warmest climates; and the effect of this vast fall of rain, continued through, we may say, four months, calculating for all that has escaped by drainage, &c., will be enormous. The four last months have been as follows:—

August .....	3 $\frac{3}{4}$ inches of rain.
September .....	3 $\frac{3}{4}$ "
October .....	3 $\frac{3}{4}$ "
November .....	6 $\frac{1}{2}$ "

or a total of upwards of 17 inches of rain in that period—nearly a foot and a-half!

But on the land itself it must have a most injurious tendency as regards its future fertility.

All food fit for plants must be soluble, at least so far as the soil supplies them. These are held mechanically or chemically in the land, or both, to be ready for the subsequent crops. Gentle showers will aid the plants to appropriate and assimilate such materials; but deluges of water like these, will carry down the manures into the subsoil and out of the drains, despite all the efforts of the tenant-farmer.

Professor Johnston showed long ago, during his investigations as chemist to the Highland and Agricultural Society of Scotland, that recently-manured fields after rains send out water from the drains distinctly impregnated with the liquid of the manure, not only appreciable to the eye, but to the chemical tests he afterwards applied to them; and though Mr. Thompson and Professor Way clearly made out the power of some soils to detain substances of a manurial tendency, they have not yet sufficiently experimentalized to settle the point whether vast quantities of water will not wash out even the detaining element. It is a well known chemical fact that large and deluging quantities of water will dissolve what would be refused to a smaller quantity; and materials are known which will not give out more than perhaps one grain to a gallon. Hence, again, a fall of rain of one inch will be powerless; while a saturation like what we have recently experienced will be absolutely ruinous. In cases where sandy lands are highly charged with ammoniacal and phosphated

manures, they will suffer immense loss by such unprecedented washing.

But it may truly be urged that the showers of rain which dissolve the manure will also bring it down from the clouds in the shape of phosphorated hydrogen, ammonia, sulphuretted hydrogen, and possibly other combinations of decay and combustion, and so return them to the soil; still it should be remembered that the half-inch of rain—the shower only—will effect this, and therefore the remainder is all loss to the soil.

Mark in the manure heaps, the effects will also be most injurious. If in one month six inches of water fall on the surface of every manure heap, how much will be the accumulated deposit in the farm-yard by the droppings of eaves, &c.? And will not all the farm-yard manure made and in the fold be in a state far inferior to what it would be in ordinary years? This is quite certain. The same may be said of the soilings of sheep left on the land, of the contents of liquid manure tanks, of the dung of cattle and sheep spread out on the fields; all tending to the following conclusion—that either there must be a sad deficiency of the usual and expected crops of 1853, or the farmer must—when the rain subsides, of which there are as yet but few indications—provide, by some means or other, the extra artificial manure for his farm, to counteract the enormous injury he has sustained. Would that it could be accomplished for him by the timely consideration of his landlord in the fair reduction of his rental; for where else can he now look for relief, with the Protection cry given up, and the repeal of the Malt Tax again postponed?

Though water is an element of vast deterioration to the soil, either stagnant in it or poured upon it, in large quantities; and in the one case, will starve the best kinds of plants, and destroy the most valuable for cultivation by the coldness produced through evaporation; and, in the other, will wash out and carry away many of those materials fit for nourishing their growth, and so defeat the efforts of the cultivator; yet, water is the medium of conveying manure to the soil as well as from it.

It is not to the rains only that we now refer. The rivers, great and small, which run throughout the length of England's vallies, all carry away vast loads of wealth, both in suspension and solution, which would make the greatest possible source of fertility if applied to the land.

Nor is it necessary to do more than let it pass over a soil, for that soil to be made to arrest and appropriate its fertilising qualities.

There is scarcely a river in the kingdom which is not valuable for this purpose. It contains at any rate the washings of several soils, the interchange of which with another, the most barren, will be

of the greatest advantage; for, as all soils contain nearly the same elements, only in different proportions, the admixture is almost certain to comprise the chemical constituents of the soil as a whole.

But it is not particles of soil alone. There are but few streams which are not fed by the dissolved particles of more or less decomposed vegetable and washed faecal matter, and therefore must be doubly valuable in supplying absolute manure in those forms in which it is the most easily available for the cultivated crops.

If we except therefore those channels which wash mineral mines, and which serve as a drain for chemical works, we shall have in all streams—low enough from their source to have any valuable matters in solution—a ready mode of applying the most valuable manure to our land.

The expense of constructing these carriers is generally the great obstacle to its adoption. The land is seldom sufficiently level to admit of the application of the principle without great original outlay and expense; but, when this is done, it repays amply for the benefit it confers. The Clipston meadows are a striking instance of the vast resources of a small stream, and the almost unlimited riches which flow from it; still the recent case of Mr. Beckford, of Crediton, shows its applicability on a scale vastly more economical than any we have hitherto had before us.

He assures us that his method was carried into full effect by Mr. Ellis, of Newton, at a cost of 7s. 6d. per acre; while his own expenses in labour &c. amounted to some 3s. per acre more—giving an entire cost of about 10s. 6d. per acre; the circumstances, however, might be considered as peculiarly favourable.

The first process in ordinary irrigation is to make the land entirely level, otherwise the vallies get flooded, and the hills derive no benefit; we mean, not that there is no fall, but the incline, whatever it may be, is on a given uniform slope.

The Beckford system, as we will call it, interferes not with the levels of the surface. Tapping the stream at its highest levels, it constructs a carrier at the head of the land to be irrigated, supplied with proper sluices. Assuming the surface to be unequal, the water would have the tendency to run down the hollows in streams. This is prevented by the cutting of another parallel carrier, which is cut so as to be as nearly level as possible. This intercepts or catches the water, carrying it again across the land to be irrigated: and this is continued so long as inequalities are found in the field.

As this, however, would leave the top always the richest in sedimental, if not in soluble matter, a contrivance of a drain feeder is constructed capable of being stopped at any one of the parallel carriers,

so that the water can be turned on to the gutters or such carriers at pleasure.

The whole of these are cut by a plough adapted for the purpose, and seem to be a very successful mode of making the water of small streams available for exciting vegetation and manuring the land.

The details of the plan are given in the *Journal* of the Royal Agricultural Society,\* and into them we shall not enter, only remarking, that a fall of 1 in 396 is considered the best, and one foot wide and six inches deep is the proper depth for the carriage gutter.

It must, however, be borne in mind, that before any irrigation can be useful, the land should be thoroughly dry, or drained from land springs: and this must be always assumed in all works for irrigation.

In the drier and warmer climates of the north of England, the system will give a command of grass from watering alone, which renders its adoption of the very first importance.

Mr. Pusey well remarks, that if this can be done even at a rate as high as £1 per acre, it will make the land £2 per acre more valuable: and this pays £100 per cent.

We have already referred to the heavy falls of rain, as affecting the farm so far as regards the tenant's interests, and the condition of the soil in reference to crops as affected by the manure in the land. But there are other considerations, of a very serious kind, which are now influencing the more permanent improvements of the soil, and the landlord is considerably interested in the inquiry.

We mean not the overcharging of sluices and the breaking down of embankments; though these are circumstances dismal enough, and very serious when they take place. The beds of rivers are altered, new channels cut through soils, and old beds of gravel laid bare instead of fertile land; but it is to none of these partial and particular cases that we now refer: we mean more particularly the effects it will have on the *drainage* of the country.

We may take the ordinary amount of rain off the back-bone of England at some 26 or 27 inches; and yet up to the end of November the fall was 30½ inches, and the quantity in December must bring the average up to 34 or 35 inches at the very least. Now, as the bulk of this fell in the four or five last months of the year, we may say that since the month of September set in with its rain, some 3,000 tons of water per acre has been emptied on the soil.

Mr. Parkes, in his observations on draining, in the Transactions of the Royal Agricultural Society, some nine years ago, gave the quantity of rain per acre as filtered through the soil in the six months from

April to September inclusive, as varying from nil to an extreme quantity of 263 tons per acre, and the average of the years from 1836 to 1843 as 91 tons per acre; the filtration of the remaining months of the year being greater, owing to the fall being more and the evaporation less; and, therefore, the filtration ranged, during those years, from a minimum of 693 tons per acre to 1,574 tons. Hence, according to his calculations, a mean of about 1,000 tons per acre—1,052 exactly—would be the quantity to provide for, by the ordinary drains.

Now, according to these tables, the filtration bore the proportion of 1,052 tons to 360 tons evaporated; and therefore if 3,000 tons of water have fallen, there must be nearly 2,000 to be carried off by the drains—constructed, in many cases, with *one-inch pipes*, and calculated for carrying the average of filtration, or 1,000 tons only.

Dr. Dalton's tables show something of the same kind. In the month of January, 1796-7-8, there was a mean fall of 2·45 inches of rain, and a mean evaporation of 1 inch. The month of February in these same years had a fall of 1·8 of rain, with an evaporation of 520.

The late lamented Mr. Charnock's experiments in 1842-3-4-5-6 gave results of a similar character, though showing somewhat less filtration in proportion to the fall of rain, but all culminating in this same point, and showing that though the evaporation was much more than was generally believed and understood, yet still there were vast quantities which passed off in that manner.

Mr. Parkes shows that under his system of drainage, all this, and even all the deluges we may have had last year, are prospectively provided for. He adduces an instance where, after a twelve hours' continuous rain, amounting to half an inch, or 108,900 lbs., or 48.6 tons per acre, each drain discharged 19 tons; and he calculates that these drains could carry off 2½ inches of rain in 12 hours, which, he adds, "is quite unknown in this climate."

Now, from the above it would appear quite clear that no damage can be permanently done by any of these incessant falls of rain to any drains *properly* executed. But we do find, practically, water standing and doing damage on lands which have always hitherto been considered as thoroughly curative.

If we for a moment consider the practical influence of the field drain, we shall readily comprehend how Mr. Parkes' figures prove quite correct, and still that the rains have really over-set the drains.

The first action of a drain is to dry the parts of the soil exactly above it, by the vacuum which it creates; this dries the next particle, and within

\* P. 172.

certain mechanical and physical limits, a drain, how deep soever it may be, must eventually dry the soil immediately above it. Now clay, when dried, possesses the peculiar property of contraction; it expands by the addition of water, and contracts when it is withdrawn. Hence the soil dried over and by the side of the drain will be full of minute fissures; these act as a set of branch drains, all leading from the tile upwards and sideways—not to allow the water to rush immediately into the drain, but to filter or trickle gradually through. But the incessant wet, the absence of

dry winds, the want of any cessation of rain, has kept the soil constantly wet, and so expanded it as to contract the fissures the more the rain fell. This process going on from month to month without ceasing, has filled up the fissures the drains have made more or less, and so diminished their efficacy. They will however soon re-open; and a few drying days, and a little atmospheric influence, will again set them in action; but in the meantime the drained land almost resembles the condition it was in when the pipes were first laid down, and when it did not absorb the water at all rapidly.

## INDUSTRIAL AND AGRICULTURAL EDUCATION.

Among the items in the budget of the late administration, there is one which, whether original or borrowed from their predecessors, may be expected to be retained by whoever may succeed them—the vote for the promotion of industrial education. We trust that, whatever of this kind may be attempted, the special interests of agriculture will not be neglected, quite so much as in that establishment in Jermyn-street, which assumes the comprehensive title of the Government School of Mines, the Museum of *Practical Geology* and of Science applied to the *Arts*. Agriculture, the most important of all arts, has as yet received nothing, or worse than nothing, from that splendid and costly establishment. It is no longer a question whether the means of acquiring an elementary knowledge of the sciences which have a bearing on agriculture—and what science has not?—should be placed within the reach of the rising generation of farmers: the only question is, how this may be best effected. Their wants will not be supplied by the foundation of a central Industrial University in London. The metropolis and the vicinity of the court may be the most agreeable residence for the professors attached to such an institution; but agriculture requires that the rudiments of science should be brought nearer to the farm-yard by means of provincial schools, in which the sons of farmers: without going far from home, may acquire a sound scientific education, which they will afterwards learn on their father's farms how to apply to practice. For the imparting of such knowledge our ancient grammar schools, with their course of study modified to suit the acquirements of the age, and with their funds enlarged from the resources of the state, appear to offer the most suitable basis, as was suggested long since, at an agricultural meeting, by Lord Carlisle. This, however, is a wide subject, which we shall not now discuss. Our present object is rather to point out evidence of a gradually-increasing desire for such knowledge on

the part of the agricultural body. The appearance of a sixth edition of the *Elements of Agricultural Chemistry and Geology*, by Professor Johnston, of the Durham University, must be deemed a satisfactory proof that farmers are a more reading class than is usually supposed. It appears that upwards of ten thousand copies of this little book—or rather great book in a small compass—have been sold at home, besides many more in the United States and the British provinces; and that it has been translated into most European languages.

During the contest, now happily ended, between Protection and Free trade, Mr. Cobden boasted that on one occasion the farmers formed a large portion of an applauding audience at a Free-trade meeting. The assertion having been denied, he met the denial by the following retort—"Who, then, and what were the three or four hundred men whom I saw before me in top-boots?" In like manner we would meet the assertion that the farmers do not read, by asking who were the ten thousand British purchasers of an elementary work on chemistry and geology in their application to agriculture, if a large portion of them did not belong to the agricultural class.

The "*Elements of Agricultural Chemistry and Geology*" constituted, in their original form, an intermediate step between the "*Lectures*" and the "*Catechism*" of Professor Johnston on the same subjects. Much which was fully examined and discussed in the "*Lectures*" was taken for granted in the "*Elements*," while for the benefit of the young, and of beginners, whether young or old, a still more condensed view of the principles of scientific agriculture was given in the "*Catechism*." This intermediate position is maintained by the present edition, notwithstanding its enlargement. The old work has been rendered more methodical, complete, and systematic, with much new matter added, to bring it in unison with the more advanced state of knowledge, attained during the ten years

which have elapsed since the appearance of the first edition. Of the 25 chapters and 410 pages to which it has now been enlarged, six chapters, containing 26 pages, are devoted to geology, and the remainder to chemistry. The chemical part must be regarded as the most valuable, not only from its greater extent, but because it is that which has been the most subject of original investigation by the author.

A work on agricultural geology yet remains to be written—nay, the details of the subject are still uncollected, for the geology of the superficial deposits has hitherto been too generally neglected, and any system which does not combine the geology of the surface with that of the substrata must be so defective, and so opposed to facts, as to prove repulsive to practical men. It is quite true that the general agricultural characters of a district are defined by the nature of the substrata; but it is equally clear that every geological group, whether the cretaceous, the carboniferous, the new red, or any other, presents a great variety of soils of very different values, those variations being independent even of the mineral characters of the rock on which the soil rests, and dependent on the depth and composition of the superficial deposits; and this even in districts where those deposits occur under their slightest development. No one is more aware of this fact than Professor Johnston, who, while adopting views previously current respecting the influence of the substrata on the general characters of a country, was among the first to point out the necessity for special agricultural maps, which should embrace those variations of soil and subsoil on which the value of land depends, but which are unnoticed in our present geological maps.

As a short, plain, and familiar exposition of the numerous subjects by which chemistry and chemical physiology are connected with agriculture, Johnston's "Elements" are unrivalled, and will long remain without a rival. They well deserve the patronage which they have received from the public; and they have contributed mainly, in conjunction with the *Journal* of the Royal Agricultural Society, so ably edited by Mr. Pusey, to the diffusion of those sound and reasonable views respecting the value of science in its relations to agriculture, which have been the growth of little more than ten years.

The organic and inorganic elements of plants—the compounds of those elements the most important to vegetable life—the nature of the seed—the manner in which the plant is fed during germination—the combinations of elementary substances

most material to its after-growth—the changes which take place during the formation of the woody stem, the development of the blossom, and the ripening of the seed—and the manner in which one generation of plants, having performed its functions, contributes by its decay to supply food for another: these are explained in this little work in the clearest, the most familiar, and the most agreeable manner. The nature of soils—the causes of diversity in their composition and fertility—the means of improving their natural value by mechanical agents or by manures containing the substances in which the soil is deficient—the comparative value of the various products of the soil as food for man and beast, and the principles on which success in the feeding of animals depends: these are all sketched with the hand of a master. The farmer who will expend a few shillings on the acquirement of this enlarged edition, and who will devote his leisure to the study of its contents, will find the work of cultivation soon cease to be with him a mere matter of routine. He will see the reasons for processes, which practice has hitherto followed empirically. He will take principles for his guide in devising new, or improving old practices; he will become more ready to listen to the suggestions of science; and while through those suggestions he obtains larger and more certain crops at a comparatively smaller cost, he will repay the debt he owes to science by furnishing her with new facts—with experiments more systematically conducted and more accurately recorded; and by suggesting for her investigation new fields of research, by which much that is now doubtful will be reduced to certainty, and more will become light on which science now confesses her ignorance.

#### AGRICULTURAL STATISTICS.

At the half-yearly general meeting of the Highland and Agricultural Society, held on Tuesday, Jan. 11, Sir JOHN MACNEILL, on the subject of agricultural statistics, stated that, after communicating with the Board of Trade, three counties had been fixed upon—Haddingtonshire, Roxburghshire, and Sutherlandshire—in which to collect the statistics experimentally. The Board of Trade had, however, required an estimate of the expense, and a considerable time had elapsed before that estimate could be made. The directors had, however, lost no time in making it up as correctly as possible. Communications had been opened with Mr. Henley, and with Mr. Cardwell, his successor in the Board of Trade, and the directors continued to persevere in doing all they could to get the experiment tried. He believed this to be a great national enterprise, and they relied upon the tenant-farmers in reference to divulging the results of their own experience. The directors had, he said, every prospect of getting up these statistics with success.

## FARMERS' CLUBS OR INSTITUTES.

(By the Author of *Liverpool a Few Years Since.*)

We are not of the number of those desponding spirits who look upon England as an old and exhausted country. We rather contemplate her as a new and young region of the earth, whose energies and capabilities, long dormant or latent, have only been recently discovered and brought to light. Their full development has yet to come. Science has revolutionised the old ways of thinking and acting. Machinery has increased her trade and manufactures. Steam has given a mighty impulse to commerce. The most remote countries are brought within the easy reach of the most adventurous of our merchants. And surely, while this tremendous "stirring of the dry bones" is going on in every other direction, the agricultural interest must not sleep. Now is the very time for our farmers to rouse themselves to exertion. They see around them the broken wrecks of political promises. They have been bitterly taught to place no trust in the hollow professions of false friends. The desperate delusion that their sufferings or trials must be helped from without, and not from within, has passed away. They have learned the sounder and healthier truths, that self-reliance is the only reliance on which they can safely depend—that they must carry with them through all their difficulties the settled belief that they alone can do their own work—that in their case as well as in that of others, the head must help the hand—that they must confide in steady industry, and in the reflection which studies every thing, weighs every thing, and looks into every thing. By so doing they will be enabled to run, and run well, in the race of competition which is set before them. And they have no choice. Necessity is upon them: they are under its spur.

We make these remarks, because the prosperity of the agricultural interest is an object which must ever deeply engage the attention and feelings of the British journalists. We can affirm truly, that it is one which we are strongly anxious to forward and promote. It is, therefore, with great pleasure that we have lately observed the increase of farmers' clubs in different parts of the country. Let us say a word or two about them to-day. Hitherto education, both with regard to persons destined to be farmers and those intended for other callings, has been too vague, and general, and haphazard, if we may so speak. Reading, writing, arithmetic, geography, history, and so forth, convey not the particular knowledge bearing on the pursuits of after life. Education for a trade or profession has to begin when school education is over. The youth who is to be a farmer has everything to learn by experience. He has no accumulated stores of the past to draw upon, but can only say at last with the man in the story, "I am old, Sir, I am old; that's why I know a thing or two." But this is a very costly

way of acquiring knowledge, and has often to be obtained at the expense of many failures. Hence the necessity for a farmers' club or institute in every village; a sort of joint-stock bank of experience, in which every agriculturist should have a lot and share. Such clubs do already exist here and there, although we look upon them as yet only in the egg. But much good may be eventually hatched out of them. If properly handled, they are made instrumental to agricultural education, and consequently to agricultural improvement. But to produce such an effect, how should they be worked? At present, in too many instances, our farmers' clubs are in danger of degenerating into mere boisterous and convivial meetings, held at distant intervals, and at which political toasts are given, landlords' healths proposed, and speeches, full of flummery and flattery on the one hand, and of "sound and fury" on the other, are made *usque ad nauseam*. Then the bill is called for and settled, and the company disperse after a social and jovial evening. But *cui bono*? What good has been effected by all this? We do not here refer to any particular meetings which may have been reported from time to time in the columns of our newspapers, but to farmers' club meetings generally, as well elsewhere as in this district. It is a popular belief, but whether well or ill founded we do not stop to inquire, that the farmers everywhere allow their landlords to think, and act, and provide too much for them. Do not let us be misunderstood when touching on this delicate subject. We know that we may congratulate the tenant farmers in this district upon the number of considerate and highly esteemed landlords, upon whose sympathies, and co-operation, and assistance, and advice they can constantly depend. But even good landlords are not immortal. As the paternal government of to-day may pass into the stern despotism of to-morrow, so the character of landlords, as death or the sale of estates does its work, is liable to perpetual change. Besides, the farmer, under any circumstances, ought to be elevated by education into intellectual independence, self-confidence, and self-reliance. How much might be done to accomplish "a consummation so devoutly to be wished," if the plan which we are hinting at were adopted. We find that there are now, attached to our mechanics' institutes, what are called "mutual improvement classes," the members of which meet to discuss any given topic, and, if we may so speak, to make the capabilities of the general brains present common property for the advantage and instruction of all. Our farmers' clubs might surely have their meetings for the furtherance of similar ends. They should not be mere social gatherings. They should not be limited to friendly intercourse, but be employed in the collision of intellect.

They should be devoted to, or, at all events, alternate with, well conducted and well considered discussions on agricultural subjects. Mutual hints and suggestions would so be thrown out. Improvements might be recounted—the success of experiments and the fruits of experience be related. The practical man and the man of science would be brought together, to compare notes and report progress. The walker in the old ways and the dashing lover of new paths might exhibit their results, one against another. And thus endless good might be achieved by the contributions of so many minds to one common stock of knowledge on the mysteries of draining, sowing, and manuring, the soil for such and such a crop, and the crop for such and such a soil. Much might be so learned. Steam thrashing machines and reaping machines were fables even in our own time. Who knows what the collision of intellect, like that of flint and steel, may yet accomplish? Agricultural works should also be taken, and so all the new inventions and improvements in machinery, implements, &c., be heard of, discussed, and tested at once. To some extent, at least, this is the plan followed by nearly all the farmers' clubs in Scotland; and that the farmers there have advanced their profession as an art at a very rapid and satisfactory pace, and have out-stripped their brethren on the southern side of the Borders, no one who knows anything on the subject will deny.

Moreover, as it has already been suggested in another quarter, it would be a great help and assistance to such clubs or associations if the clergy would be induced to attend them, and take a leading part in their management and discussions. Do not let them be frightened from doing so by the notion that in complying with such a suggestion they would be abandoning their spiritual functions to mix themselves up too much with secular and worldly objects. Not so in this case. We are not, they must bear in mind, inviting them to attend factious political meetings, but to give their sympathy and support to a most laudable purpose—that of improving the means of providing, and consequently of increasing, the food of their fellow-men. It has been said that he who makes two blades of grass spring up where only one was produced before, is the greatest earthly benefactor of mankind. If this be true, to co-operate for such an end must not only be not unclerical, but highly clerical. And the very presence of a body of men of superior education would check and control any unseemly digressions from the purposes of our clubs. If the clergy will uphold them they cannot fail. If they do not bring to pass all which the most ardent enthusiasm anticipates, they will, at least, work much practical good and improvement. When steam and science announce themselves to be farmers' friends, the farmers themselves ought to be prepared to take advantage of the valuable assistance offered.

We confess to great interest and anxiety on the subject of which we have been speaking. It is a matter of high pleasure and gratification to a journalist on the

Liberal side, to find himself no longer in a seeming antagonism to the agricultural interest, but working with its members on common ground for their benefit and profit. Our wish is to help them in every possible way; and if in the hint now thrown out we do this in the smallest degree, we shall be happy to know that our "labour of love" has not been "love's labour lost."

### AUSTRALIAN GUANO.

One of the most important items of intelligence received from Australia by the recent arrivals is, that of the existence of a large deposit of guano recently discovered in South Australia. The attention of the local government had been immediately directed to a matter of so great importance, not only to the colony itself, but also to the mother country. Instructions were issued for an analysis of a sample of the guano, and the following is the official report thereon, which the lieutenant-governor had ordered to be published for general information:

"Sir,—I beg to forward for the information of his Excellency the Lieutenant-Governor, the following analysis, which I have had made of a specimen of guano which I received from his Excellency some time back, but which my numerous avocations, consequent upon the establishment of this office, have prevented my attending to at an earlier period.

#### ANALYSIS OF A SPECIMEN OF SOUTH AUSTRALIAN GUANO, IN 100 PARTS OF WEIGHT.

Carbonate of ammonia .. .. .	35
Carbonate of lime .. .. .	11.5
Organic matter .. .. .	20.0
Silicious sand .. .. .	10.0
Sulphate of soda .. .. .	2.5
Muriate of soda or common salt .. .. .	10.0
Phosphate of lime .. .. .	30.0
Water .. .. .	12.5

100.0

"From the above analysis it would appear that the amount of comparatively useless matter in the form of carbonate of lime, silicious sand, common salt, and of water, constituting altogether 44 per cent. of the sample, is unusually large as compared with samples of the best Peruvian guanos. In order the more readily to compare the analysis of this sample with the average result of the analyses of the best genuine guano, as given by Dr. Ure, I subjoin the following table:

#### FERTILIZING CONSTITUENTS.

	Average of Ure's Analysis of genuine Guano.	Analysis of South Australian Guano.
1. Animal matter .. .. .	50	20
2. Phosphate of lime .. .. .	18½	30
3. Ammonia in various forms. .. .. .	13	3½
	81½	53½
OTHER MATTERS.		
4. Silicious sand .. .. .	1	10
5. Common salt, carbonate of lime, &c. .. .. .	8	24
6. Water .. .. .	9½	12½

Total of other matters. 18½ .. .. . 46½

"The foregoing analysis of South Australian guano was made by Mr. Jones, one of the chemical assistants in this office, and does not pretend to any extreme accuracy, as the time that could be devoted to this purpose was limited. It should also be observed that probably a portion of the ammonia, a valuable constituent of guano, present in the sample, might have been volatilized before analysis, it having been kept some time in a warm room.

"I have the honour, &c.,

"B. HERSHELL BABBAGE,

"Mineral and Geological Surveyor.

"The Hon. the Colonial Secretary."

## EAST OF BERWICKSHIRE FARMERS' CLUB.

[The following is from Mr. Milne Home's Report on farms where the system of liquid manuring and stall-feeding of sheep is practised.]

## CUNNING PARK, NEAR AYR,

BELONGING TO AND FARMED BY MR. TELFER.

23rd Oct., 1852.—This farm contains 48 acres, and is entirely devoted to a dairy of forty cows. No corn is grown on it. Hay, grass, and green crops are raised.

There are two large tanks, the contents of which are forced through pipes into the fields by an engine of three-horse-power. The tanks are not covered, which is a great drawback; Mr. Telfer hopes to get this defect remedied soon.

The liquid only flows into the tanks, the solid being kept by itself, and dibbled in for root crops. The liquid does not nearly supply all the manure required for the Italian rye-grass. Mr. Telfer irrigates it to the extent of 20,000 gallons per acre after every cutting, for which purpose he mixes guano in his tanks, and also nitrate of soda. The latter is found most efficacious. About 4 cwt. per acre is the proper quantity. Italian rye-grass is sown at the rate of 4 bushels to the acre. The seed is supplied to him by Mr. Dickenson, of London. Mr. Telfer does not allow his Italian rye-grass to stand for two years, in which respect his practice differs from others. He considers that there is more nutriment in the first year's crop—so much so as to justify the additional expense of seed and labour. He also mentioned that after the plant had run to seed, it ceases to afford much herbage.

Mr. Telfer found by experiment that 2 cwt. of Peruvian guano produce 5½ tons rye-grass, and 4 cwt. produce 7½ tons per acre. Both were the produce of one month's growth.

In middle of summer his fields yield weekly about four tons of grass; one ton of grass will yield 6 cwt. of excellent hay.

He considers that for feeding cows, 1 ton of ryegrass is equal for nourishment to 1½ tons of turnips.

His cows consume each daily 112 to 130 lbs. of ryegrass, with 2 lbs. of oilcake, so that if an acre of ryegrass yields 45 tons of meat in the six months, which is the case at Cunning-park, about five or six cows can be fed on an acre in that time. Mr. Telfer grows all the kinds of mangolds. He prefers, however, the long to the globe; of the long yellow he had 25 tons, the long red 23 tons per Scotch acre.

The following is Mr. Telfer's statement of his crops for next year, with his estimate of the expected produce per Scotch acre, these being the quantities which he has hitherto raised:—

	Acres.	Tons.
Mangolds.....	6	45
Cabbages.....	6	60
Italian rye grass....	6	45

On his land he lays 50 tons of solid dung per acre, which is ploughed in, and immediately before sowing he applies the guano or nitrate, which is followed by liquid manuring.

Mr. Telfer's compound for his cows, at the time of my visit, was as follows:—

Turnips	10 cwt.	} Divided daily among 42 cows, being at the rate of 126lbs. to each.
Cabbages	8 "	
Potatoes	8 "	
Rye grass	21 "	
	47	

Mr. Telfer mentions that the quantity of liquid manure produced by a cow is nearly equal to the quantity of milk she gives, and that the solid dung obtained from each is about 12 tons yearly.

BURNTURK, NEAR KINGSKETTLE, FIFE,  
THE PROPERTY OF, AND FARMED BY ALEX. LAWSON, ESQ., LINEN MANUFACTURER THERE.

4th November, 1852.—This farm consists of 136 Scotch acres. The arrangements for laying pipes to all the fields were commenced last winter, so that there has not been time yet to ascertain the effects either on the crops or on the stock.

Only one tank is in operation. It holds 50,000 gals. But two more are to be constructed immediately, of still larger size. The tank has a float in it, with a rod which rises to a conspicuous height, and which by a graduated scale thereon shows the depth of the liquid and number of gallons in the tank. The object of this float and rod attached is to show by the sinking of it whenever a certain number of gallons have been distributed over a measured portion of the ground. Mr. Lawson allows none of the solid dung to get into the tank; it is the liquid only which flows from his cattle stalls and boxes.

The stalls and boxes are constructed in a very superior style. The arrangements for ventilation are especially perfect. Water is supplied by a cock to each box and stall.

Mr. Lawson has divided his farm into fields of 11 acres, each having a hydrant in the centre. To this a hose of about 75 yards in length is attached, consisting of separate pieces, each 25 yards in length. The first two pieces are 2 inches in diameter, the next two 1½ inches, the last two 1¼ inches.

I was conducted to a field of Italian ryegrass, half of which was sown with nothing but ryegrass, at the rate 5 bushels per Scotch acre; the other half had been sown with barley at the rate of 2 bushels, and with ryegrass at the rate of 3 bushels. The object of the experiment was to ascertain which would yield the best return.

My attention was chiefly interested with the arrangements of the buildings and machinery; any account of them, however, would be foreign to my present object—except, perhaps, to mention that it is intended to con-



duct the waste steam into the tank with the view of accelerating fermentation.

In the foregoing report I have endeavoured to abstain from any intimation of my own opinions or impressions, desiring only to communicate such information as I procured when visiting the several farms referred to. It will be for the practical farmers of the club to say whether the system of husbandry reported on, which so materially differs from anything known in Berwickshire, is one which should be encouraged, or at least it affords any hints for modifying our practice. I shall listen with much interest to the opinions which may be expressed on these points, being assured that there are many present, who, from their experience and intelligence, are far more able than to judge of the utility of the system I have been describing. I confess that the impression formed on my own mind, from what I saw and heard during an inspection of the four farms which I have reported on, and from what I have since read of other places where a like system is practised, is favourable to its more general adoption; and but for that impression, I would not have brought the subject before the club. But it is an impression only, and one which it would neither grieve nor surprise me if I give up, after hearing the matter fully and fairly discussed at such a meeting as the present. With the view of giving a character of relevancy and precision to our discussion, I may conclude by mentioning the different points, which, as it strikes me, are the most material to be considered.

I. On the one hand account must be taken of the expense of the process, consisting of the wages of the persons employed to manage the distribution, the fuel necessary for working the engine, and the interest on capital.

From what has been before stated in regard to Myremill, it appears that though the expense of irrigating by pipes and steam power is estimated by the Board of Health Commissioners at 14s. per acre, the amount should not be stated at more than 10s. or 12s. per acre; a conclusion which is confirmed by the fact that at the farm of Halewood, near Liverpool, containing 350 acres, the working expenses annually amount to 9s. 9½d.; and that at Mr. Liddledale's farm, near Birkenhead, containing 150 acres, the expense is only 9s. 0¾d. per acre.

II. The other side of the account, which shows the advantages of the system, may be divided into two heads—one connected with the liquid manuring, and the other with stall feeding of sheep.

(1.) Under the first of these, account may be taken of the greater economy of transporting manure out to the land. It is shown very clearly in the Board of Health Report that the cost of transmitting liquid manure through pipes and hose is twopence per ton, within a distance of three-quarters of a mile. Now, what is the cost of conveying a ton of manure by carts and horses? To take it out by a water barrel would be ruinous. But in the simplest way, which is in the form of farm-yard dung, the cost for half a mile, when filling

and spreading are included, cannot be stated at less than sixpence a ton; so that for every ton there is a saving of fourpence by piping.

Now it is stated in the Board of Health Report, that "one lot of Swedes (on the farm of Myremill), dressed with 10 tons of solid farm manure, and about 2,000 gallons of the liquid, having 6 bushels of dissolved bones along with it, was ready for hoeing ten or twelve days earlier than another dressed with double the amount of solid manure, without the liquid application, and were fully equal to those in a neighbours' field which had received 30 loads of farm-yard dung, together with 3 cwt. guano and 16 bushels of bones per acre. The yield was estimated at 40 tons the Scotch acre."

The cost of manuring these swedes by the pipes was, according to the above data, 6s. 6d. per acre; and by carts and horses, 10s. in the one case and 11s. 6d. in the other—showing a saving, therefore, of from 3s. 6d. to 5s. per acre on the turnip break. Had the manuring been heavier, or the transport farther, the economy of piping would have been proportionally greater. Applying these results to the farm of Myremill, it will be remembered that there were, this year, 157 imperial acres of green crops, on the manuring of which by pipes, instead of by carts and horses, there must have been a saving of £35 6s. There were 87 acres of Italian ryegrass, which, after every cutting, has between 4,000 and 5,000 gallons applied to each acre. This is at the rate of 22 tons an acre; and, supposing it cut five times, 110 tons per acre would be applied during the season, at a cost of 18s.; whereas, if that quantity of manure had to be applied by carts and horses, it would have cost 55s. per acre. On these 87 acres, therefore, a saving of 37s. per acre was effected, amounting to £160 19s.

(2.) The next item for consideration is the quantity of produce raised. That the produce is greater, both of grass and of green crops, seems to be scarcely deniable. The cause of this is partly the greater efficacy of manure when in a liquid form, and partly the nature of the ingredients composing it. It should be remembered that the tank liquid contains a larger proportion of salts, particularly urea, than farm-yard dung. Of urea Professor Johnston remarks that "it is far richer in nitrogen than flesh, blood, or any of those other richly fertilizing substances, of which the main efficacy is supposed to depend upon the large proportion of nitrogen they contain." My position is, that 10 tons of farm-yard dung and 10 tons of tank manure, form, together, most probably, a richer compound than 20 tons of farm-yard manure alone. Then there is this other consideration, that the liquid being soluble, the whole of it can at once be appropriated by the roots of plants. Hence there need be no surprise at the fact stated in the Board of Health report, that 10 tons of farm-yard dung, with 2,000 gallons of liquid manure, with 6 bushels of dissolved bones in it per acre, produced as good a

crop of swedes as 22½ tons of farm-yard dung, with 3 cwt. of guano, and 16 bushels of bones.

Without attempting to estimate the excess of the several crops of turnips, cabbages, mangolds, and carrots at Myremill, over those obtained by the ordinary system of manuring, I will assume that the excess is equivalent to 10 per acre of swedes on the whole green-crop break, which at Myremill is 157 acres; and estimating the value of swedes at 10s. per ton, which seems a very moderate price, especially when the nature of some of the crops is considered, the profit under this head will be £785.

In regard to the additional produce from the grass break, my estimate is as follows:—About 400 tons of food per acre are raised by sowing Italian ryegrass, cutting and manuring it five or six times during the months of summer and autumn; whereas by raising ordinary ryegrass and clover about sixteen tons are got—showing an excess therefore of twenty-four tons per acre, and which at the price of £10 per ton would give £13 per acre.

But from this return must be deducted the cost of cutting and carrying these twenty-four tons, and of manuring the land after every cutting. The cutting would probably amount to 4s. and the carrying to 6s. The cost of manuring depends on circumstances. At Enterkine Farm, as we have seen, where milk cows only are kept during the summer, Mr. Bell, to supply the deficiency of liquid manure, gives to each acre sixteen cwt. of guano. But a feeding bullock gives a much larger supply of liquid manure—it is believed about ten gallons daily; so that the seven bullocks which Mr. Kennedy says can be supported on one acre of Italian ryegrass would, during six months, give altogether 12,600 gallons, which, diluted with three waters, amount to 50,400 gallons, being equal to what is required for the whole five cuttings in the course of the season. The only expense, therefore, is sending this liquid through the pipes, which at 2d. per ton, is £1 17s. 6d. This, and the cost of cutting and carrying, amounting altogether to £2 7s. 6d., leaves a profit of £10 12s. 6d. for every acre of ground cropped with Italian ryegrass, and yielding on the whole break £924.

To these items there might be added the larger crops of corn which are said to be raised; but as no precise data were obtained by me for estimating this item, I pass it over.

The foregoing calculations are connected with the system of liquid manuring. Those which follow are dependent on the system of feeding sheep on sparr'd boards, and under cover.

(1.) The saving of manure is one item; this Mr. Kennedy estimates at 2s. 6d. per sheep, amounting to £57 10s. on 460 sheep.

(2.) The additional weight and improved quality of the wool is another. An addition of 2lbs. to each fleece would probably add to the value of each sheep 2s., amounting to £46. To these should be added, the improved health of the sheep, and their more rapid fat-

tening, especially during the winter and spring months; but I am unable to set a money value on these. Putting together all the other items which I have attempted to estimate:—

1. Economy of transporting manure—			
For green crops . . . . .	£35	0	0
— Italian ryegrass . . . . .	160	19	0
			195 19 0
2. Additional produce			
From green crops . . . . .	£785	0	0
— Italian ryegrass . . . . .	924	0	0
			1709 0 0
3. Sheep stall-fed			
From manure . . . . .	£57	10	0
— wool . . . . .	46	0	0
			103 10 0
			£2008 9 0

This sum, when divided by the number of acres on the farm, gives a return of rather more than £5 to meet the expense of 10s. per acre.

I owe an apology for attempting to offer calculations which only a practical farmer can accurately make. I am quite prepared to have errors pointed out in them, as I pretend not to a personal knowledge of the prices and expenses which I have assumed. What is more, I shall feel indebted to the practical members of the club, if they will point out the errors which I have committed, being in this matter most sincerely desirous of expiscating only the truth, and of ascertaining whether the favourable impression I entertain of the system reported on, be or be not founded on sound principles. These calculations I ventured on, as the best way of indicating the points which, it occurs to me, should be chiefly embraced in our discussion, and with the view of drawing out the practical members of the club on ground which they are so well qualified to occupy. The tenantry cannot do a greater service to proprietors than by correcting their mistakes in such matters; and it is one of the peculiar advantages of such a club as ours, that it affords to both classes an opportunity of discussing in a free and friendly way subjects which are of the utmost interest and importance—and not to them only, but to the country generally.

SALE OF MRS. E. HERBERT'S (OF POWICK) COCHIN CHINA FOWLS.—This sale has excited a great deal of attention among the breeders and fanciers of this gigantic breed of poultry, from the well-known purity of the breed, and the success with which Mrs. Herbert has reared so many fine specimens. The sale took place in London, at the Baker-street Bazaar, on Wednesday, January 5th, by Mr. Stranford, and was numerously attended by persons from all parts of the country. 80 white birds were sold for an aggregate sum of £315 2s., which exceeds the average of the sale of the stock of Mr. Sturgeon, a celebrated breeder, which took place at the same bazaar on the 2nd of November last. It may show the estimation in which Mrs. Herbert's birds are held, when we state that Mr. Sturgeon purchased one of the fowls sold on this occasion at 20 guineas, and that one pullet realised 13 guineas, and another 10 guineas. Some chickens only three months old brought from £4 to £5 each. The buffs also sold well; and the black Cochins, belonging to the same lady, sold for about £3 5s. each.—*Worcester Herald*.

## THE GREAT METROPOLITAN POULTRY SHOW.

The first show of the society for establishing in the metropolis an annual exhibition of poultry, pigeons, and rabbits was opened to the public on Tuesday, Jan. 11. The society enjoys the patronage of many noblemen and gentlemen of distinction, including the Duke of Rutland, the Marquis of Salisbury, the Earls of Derby, Stanhope, Cottenham, Stradbroke, Harrington, Ducie, Clarendon, Lichfield, and Stamford; Lord Feversham, Lord Hastings, Lord Sandys, the Marquis of Granby, and Lord Guernsey; and one of its main objects is, according to the rules, "to afford an opportunity to the public to improve their collections." It is therefore provided that all the specimens figuring in the show shall be offered to competition by public auction during the exhibition, the proprietors being required to state the value they place upon the birds or animals they exhibit, although they are not precluded from naming a prohibitory price. The place selected for the exhibition was the Baker-street Bazaar, where the show of the Smithfield Cattle Club has been held, and the extensive and commodious galleries of the building are admirably adapted for the purpose. On Monday night the subscribers and a number of invited visitors were admitted to a private view of the collection, which was of a novel and interesting character, presenting a far more extensive combination of that class of the feathered tribe termed "domestic fowls" than was ever before exhibited in any one place. The show included fowls, turkeys, geese, ducks, pigeons, and rabbits, but among them what is ordinarily spoken of as the fowl tribe vastly preponderates, and in this little world of fowls the Cochin Chinese had a decided majority. The Cochin China fowls were introduced into this country some half-dozen years ago under royal patronage, and now enjoy a preference over the Dorking game and Hamburg fowls. The respective merits of these classes can, however, only be determined by connoisseurs, and it is enough to say that the Cochin China fowls in the collection were of remarkable size and beauty. The price set upon some of these birds seems almost incredible. For a pen belonging to Mr. Fairlie, of Cheveley-park, near Newmarket, consisting of a cock and three hens, no less than 60 guineas were required. It may, however, be observed that all the hens have been exhibited separately at provincial shows, and that each has gained a prize; so that the pen was probably as valuable a one as could be found in the country. In class 15, a pair of Cochin China fowls cost £25. Mr. Fairlie, of Cheveley (who had in the collection 29 pens), showed a pen of light speckled Scotch fowls, from Ayrshire, known in the north as "dumpsies" or "bakies," and which are remarkable for the extraordinary shortness of their legs. Among those which attracted marked

attention some exceedingly fine Poland fowls, with white topknots; a pen of three geese, weighing together 48lbs.; a pen of gigantic pigeons from India, whose heads are surmounted by a sort of plume, not much unlike the feathers of a peacock's tail; several very fine Australian pigeons, the beauty of whose plumage was much admired; a large collection of pigeons, including some very good specimens of fantails, tumblers, and carriers; and some remarkably fine turkeys, bantams, and rabbits. So great value is placed upon the eggs of many of the birds in the exhibition, that eight police-officers of the detective force were continually on the watch to prevent their abstraction by persons employed in the building or by visitors.

The following is the list of prizes awarded by the judges:—

## POULTRY.—SPANISH.

First prize, Captain Hornby, Knowsley-cottage, near Prescott, Lancashire; second prize, Mr. Fox, Skinner-street, Snow-hill; third prize, Mr. Thomas Jones, Vale-place, Hammersmith.

First prize, Mr. Thomas Fox, Skinner-street, Snow-hill; second prize, Mr. T. Jones, Vale-place, Hammersmith; third prize, Captain Hornby.

First prize, Captain Hornby; second prize, Mr. John Taylor, Shepherd's Bush.

## DORKING.—(SINGLE-COMBED.)

First prize, Mr. J. Lewry, Handcross, Crawley; second prize, Mr. J. Boys, Biddenham; third prize, Captain Hornby.

First prize, Mr. J. Lewry; second prize, Mr. John Fairlie, Cheveley-park, Newmarket; third prize, Mrs. F. Noyes, Salisbury.

## DORKING.—(DOUBLE OR ROSE-COMBED.)

First prize, Sir J. Cathcart, Cooper's-hill, Chertsey; second prize, Mr. J. Thorn, Mawley-house, South Lambeth.

First prize, Mr. Thomas Nioe, Great Bradley-hall, Newmarket; second prize, Mr. John Fairlie.

## DORKING.—(DOUBLE OR SINGLE-COMBED.)

First prize, Captain Hornby; second prize, Mr. John Boys. Highly Commended.—Mr. W. Harrison, Bayworth-park; Messrs. Baker, Chelsea.

## DORKING.—(WHITE.)

First prize, Mr. J. Jeemens, Moseley; second prize, Mr. James Oldham, Long Eaton, Derby; third prize, Mr. Nathaniel Anthill, Portsea. Highly Commended.—Mr. Oldham.

First prize, Mr. Joseph Jeemens, Moseley; second prize, Mr. H. Forster, Markgate-street, Dunstable. Highly Commended.—Mr. Oldham.

## COCHIN CHINA.—(CINNAMON AND BUFF.)

First prize, Mr. John Fairlie, Newmarket; second and third prize, Mr. T. Potts, Kingwood-lodge, Croydon.

First and second prize, Mr. T. Potts, Kingwood-lodge, Croydon; third prize, Captain Squire, Barton-place, Mildenhall. Highly Commended.—Mr. J. Eaton, Thurlow-lodge, Lower Norwood; Mr. H. Collinson, 47, Castle-street, South-

wark: Mr. J. C. Adkins, Edgbaston, Birmingham. Commended.—Mr. G. Peters, Mozeley, Worcester.

COCHIN CHINA.—(BROWN AND PARTRIDGE FEATHERED.)

First prize, Mr. John Chater, Haverhill; second prize, Mr. Thomas Bridges, Bridge-cottage, Croydon.

First prize, Mr. Thomas York.

COCHIN CHINA.—(CINNAMON AND BUFF, OR BROWN.)

First prize, Mr. John Bidwell, Guildford; second prize, Mrs. George Chaldon, Conlson, Surrey; third prize, Captain Squire. Highly Commended.—Rev. C. Hall, Durham-cottage, Usbridge; Mr. J. Fairlie; Mr. M. Whittingham, Woodford-bridge, Essex. Commended.—Rev. J. G. Hodgson, Croydon; Mrs. George; Mr. Thomas Potts; Mr. W. R. Morris, Deptford, Kent; Mr. C. Cooper, Guildford.

COCHIN CHINA.—(WHITE.)

First prize, Mr. J. Fairlie; second prize, Mr. E. I. Preston, Great Yarmouth.

First prize, Rev. Dr. Allen, Englefield-green; second prize, Mr. G. C. Adkins, Edgbaston.

MALAY.

First prize, Mr. Soanes, Stepney, Middlesex; second prize, Mr. G. Oldham, Nether Whiteacre.

GAME FOWL.—(WHITE AND PILES.)

First prize, Mr. H. Thurnall; second prize, Mr. W. G. Vivian Singleton, Glamorganshire.

First prize, Mr. W. Groom, Holt, Norfolk; second prize, Mr. R. Wilson, Moccn-place, Stamford-le-Hope.

GAME FOWL.—(BLACK-BREASTED AND OTHER REDS.)

First prize, Captain Hornby; second prize, Mr. F. H. Powell, Hillingdon, Middlesex; third prize, Mr. A. Connell, Cringleford, Norfolk.

First prize, Mr. M. Wilson; second prize, Mr. Tickell, 51, Doddington-grove.

GAME FOWL.—(BLACKS AND BRASSY-WINGED, EXCEPT GRAYS.)

First prize, Mr. W. Detlen, Seckington, Warwickshire; second prize, Mr. R. W. Wilson.

GAME FOWL.—(DUCKINGS AND OTHER GRAYS AND BLUES.)

First prize, Mr. H. Thurnall, Royston, Cambridgeshire; second prize, Mr. E. A. Lidgard, Snow-hill, Birmingham; third prize, Mr. G. C. Adkins.

First and second prizes, Mr. R. W. Wilson; third prize, Mr. C. Stiuton, Ainsworth.

GOLDEN PENCILLED HAMBURGH.

First prize, Mr. J. B. Chune, Colebrook-dale; second prize, Mr. J. E. Mapplebeck, Hlgate, Birmingham; third prize, Mr. T. Aeale, Norfolk.

First prize, Mr. H. Worrall, Knotty Ashhouse, Liverpool; second prize, Mr. T. B. Aeale, Norfolk.

GOLDEN SPANGLED HAMBURGH.

First prize, Mr. G. Adkins; second prize, Mr. Lightfoot, Markgate-street, Dunstable; third prize, Mr. J. G. Adkins.

First and second prizes, Mr. J. Mould, Mackinney-house, Belper.

SILVER PENCILLED HAMBURGH.

First prize, Mr. E. How, Bromley, Middlesex; second prize, Mr. E. Archer; third prize, Mr. F. Wigan, Edgbaston.

First prize, Mr. McCall, Malvern; second prize, Mr. J. Mapplebeck.

SILVER SPANGLED HAMBURGH.

First prize, Mr. J. Whilock, Birmingham; second and third prizes, Mr. W. G. Chambers, Portsmouth.

First prize, Mr. E. Simois, Dale-end Birmingham; second prize, Mr. J. Whilock.

POLAND FOWL.—(BLACK WITH WHITE CRESTS.)

First and second prizes, Mr. J. C. Adkins; third prize, Mr. T. B. Edwards, Lyndhurst.

POLAND FOWL.—(GOLDEN, WITH RUFFS OR BEARDS.)

First prize, Mr. J. E. Mapplebeck; second prize, Mr. W. G. Vivian; third prize, Mr. C. Clarke, Street, near Glastonbury.

First prize, Master G. Horner, Charlotte-street, Hull.

POLAND FOWL.—(GOLDEN, WITHOUT RUFFS OR BEARDS.)

First prize, Mr. J. E. Mapplebeck, Birmingham; second prize, Miss E. S. Perkins, Sutton Coldfield.

First prize, Mr. W. Cutler, Bathampton; second prize, the Hon. Mrs. Finch, Berkhamstead.

POLAND FOWL.—(SILVER, WITH RUFFS OR BEARDS.)

First prize, Messrs. Baker, Chelsea; second prize, Mr. E. Clarke; third prize, Mr. G. Vivian.

First prize, Mr. G. Vivian; second prize, Master G. Horner.

POLAND FOWL.—(SILVER, WITHOUT RUFFS OR BEARDS.)

Second prize, Mr. C. J. Mould.

BANTAMS.—(GOLD-LACED.)

First prize, Mr. G. C. Adkins; second prize, Mr. H. T. Leigh, Turnham-Green.

BANTAMS.—(SILVER-LACED.)

First prize, Mr. H. J. Jones, Bedford; second prize, Mr. J. Fairlie.

BANTAMS.—(WHITE.)

First prize, the Rev. G. F. Hodgson; second prize, Mr. Joseph Dutton.

BANTAMS.—(BLACK.)

First prize, Mr. J. Fairlie; second prize, Mr. T. H. Fox.

BANTAMS.—(BLACK-BREASTED RED.)

First prize, Mr. W. S. Forrest, Greenhithe.

BANTAMS.—(GINGER OR BUFF.)

First prize, Mr. Dutton.

The success of this extraordinary show must have fully equalled the expectations of its most sanguine promoters, especially considering that at this period of the year London is almost deserted by those classes who may be supposed to take the greatest interest in matters connected with agricultural pursuits, and who would have been most likely to patronise such an exhibition as that now submitted to the public in the galleries of the Baker-street Bazaar. On Tuesday, when the charge for admission was five shillings, some hundreds of visitors, including several members of the aristocracy, inspected the collection. On Wednesday and Thursday the entrance-fee was reduced to one shilling, and though the unfavourable weather on Wednesday must have prevented many persons from visiting an exhibition so far removed from the centre of London, yet, either owing to the novelty of the show, or to the extraordinary mania for poultry-rearing which has been excited of late years, the Bazaar was on both days thronged by such crowds that locomotion was rendered somewhat difficult. On Wednesday upwards of 5,000 persons paid for admission, and on Thursday the number of visitors must have been much greater. The excellent regulations of the police, however, prevented anything like disorder, and under their directions the visitors proceeded in a continuous stream along the galleries of the Bazaar, on each side of which the pens containing the animals exhibited were arranged.

We subjoin a statement of the number of classes and pens exhibited; and it may be observed that each pen contained from two to four animals:—

Fowl.	Classes.	Pens.
Spanish... ..	3	36
Dorking ... ..	7	70
Cochin-China ... ..	7	249
Malay ... ..	2	10
Game ... ..	8	48
Hamburgh ... ..	8	57
Poland ... ..	9	37
Bantams ... ..	4	63

There were also 45 pens of other distinct breeds of fowls, 11 pens of geese, 33 pens of ducks, 10 pens of turkeys, 249 pens of pigeons, and 48 pens of rabbits.

Although the regulations of the club under whose auspices the exhibition took place required that the proprietors of all the stock shown should affix a value to their specimens, which were to be submitted to public auction during the exhibition, many of the prices given in the catalogue were absolutely prohibitory. Several pens of the Cochin-China fowls and chickens were valued at 1,000*l.*, 500*l.*, 200*l.*, 100 guineas, and 100*l.*, while others were priced—doubtless for sale—at sums varying from 80*l.* down to 1*l.* 1*s.*, according to the age, condition, and breed of the birds. The value placed on Spanish fowls varied from 100 guineas to 2*l.* 10*s.* a pen. The Dorking, Malay, game, Hamburgh, and Bantam fowls were priced at sums ranging from 100 guineas to 40*l.*, 25 guineas, and as low as 1*l.* a pen. Two of the pens of Poland fowls were valued at 1,000*l.*, of course a prohibitory price, the proprietors being probably unwilling to dispose of them at all, but the selling prices seemed to vary from 50*l.* downwards to 2 guineas. The highest price placed upon a pen of geese was 21*l.*, and the lowest 1*l.* 10*s.* Of the 33 pens of ducks exhibited, one, belonging to Mr. Fairlie, of Cheveley-park, was valued at 100*l.*; but the price placed on the other pens varied from 21*l.* to 1*l.* 10*s.* Some of the turkeys exhibited were of great size and of remarkably fine plumage, and the pens were valued at from 10*l.* 10*s.* to 3*l.* 3*s.*

A printed notice, of which the following is a copy, was posted on the walls of the Bazaar: "All eggs laid during the show will be destroyed. Any person purloining one will be immediately given into custody."

The sale by auction of the various specimens was commenced at noon on Thursday, by Mr. Strafford, the sale being, however, subject to the reserved prices of the exhibitors. For many of the lots upon which high prices had been placed by the owners there were, of course, no bids at all approaching the nominal value, and although in some cases higher prices were obtained than had been fixed in the catalogue, in many instances the stock failed to realize the amount at which it had been valued. The competition, especially in the Cochin-China classes, was most spirited where the reserved prices were *bona fide*, and not prohibitory. The most extraordinary were the following:—In Class 15, which was for pairs only of the best Cochin-China, cinnamon, buff, or brown, best cock and one pullet, chickens of 1852. No. 81 pen, which obtained the first prize, and belonged to Mr. John Bidwell, of Guildford, hatched in May last, realized the extraordinary price of £49 7*s.* These birds were bred by Mr. Fletcher, of Kensington, from fowls which obtained the first prize and extra medal at Birmingham in 1851. The reserve price fixed by the owner was but 15 guineas, and had he not submitted them to auction he would have been a loser of just £34. No. 82, be-

longing to Mr. C. Cooper, of Guildford, bred by the same gentleman, the reserve price of which was 5 guineas, sold for 19 guineas. No. 87, a buff cock and pullet, from the stock of Mr. Farlie's first prize hen, bred by Mr. Gilbert, of Kensington, sold for 15 guineas. No. 97, a silver cinnamon pullet, bred from Mr. Gilbert's "Queen" hen, was sold to Mr. John Taylor, of Cressy-house, Shepherd's-bush, for 18 guineas. Mr. Gilbert's hen, the "Queen," sold for 16 guineas, and was subsequently resold for 18 guineas. In Class 16, white Cochin-Chinas, the pen belonging to the Rev. Dr. Allen, of Englefield-green, hatched in June and July last, the reserve price for which was £10 10*s.*, sold for £26 5*s.* In the Dorking classes the Lord Berwick and Sir Archibald McDonald were amongst the principal competitors.

Friday was the last day, and it is computed that the number of persons who passed through the galleries of the Bazaar amounted to little short of 12,000. Amongst the visitors were his Excellency the Turkish Ambassador and suite, the Belgian and Swedish Ambassadors, the Earl of Wilton, Lord Sandys, Lord Brougham, &c., &c. The sales of the various specimens were resumed by Mr. Strafford, commencing with class 20, but the prices realized were not so great as those on the previous day, when the Cochin-China specimens were sold. The most remarkable was in class 43, Poland fowls. Mr. W. G. Vivian (of Singleton) pen, which obtained the first prize, sold for twelve guineas, and No. 3 in the same class, belonging to Master G. Horner, of Hull, aged seven months, fetched six guineas. In the pigeon classes there was considerable competition, some of the specimens realizing as much as 5*l.* per pair, and some of the Aylesbury ducks fetched from 10*l.* to 14*l.* per pen. A vast number of lots remain unsold, but it is understood that those which found purchasers realized upwards of 1,000*l.* A number of agriculturists attended the sale, and the impression appeared to be that the breeding of poultry was now becoming more profitable than even the breeding of cattle.

## LONDON FARMERS' CLUB.

The following subjects have been selected for Discussion during the present year:—

- Feb. 7.—What course ought Farmers, individually and collectively, to pursue under the altered circumstances in which they are placed? Proposed by Mr. S. Checham, of Totton, Southampton.
- March 7.—On the most economical and best methods of Breeding and Keeping Cart Horses. Mr. N. G. Barthropp, of Cretingham Rookery, Woodbridge.
- April 4.—The Construction of Farm-buildings—the best Mode of Housing and Feeding Cattle, and the Prevention of Waste in Manure. Mr. J. Bradshaw, of Knole, Cranley, Guildford.
- May 2.—On the Comparative Advantages of the Application of Fixed and Portable Steam Engines to Agricultural Purposes. Mr. Allan Ransome, of Ipswich.
- June 6.—On the many Difficulties which oppose the Transfer of Land, and the Improvements that would result from facilitating the Process. Mr. W. Fisher Hobbs, of Boxted Lodge, Colchester.
- Nov. 7.—The Influence of Science upon Agriculture in its progressive stages from the earliest period to the present time. Mr. R. Baker, of Writtle, Chelmsford.
- Dec. 6.—On the Advantages of a Central Farmers' Club. Mr. G. H. Ramsey, of Derwent Villa, Newcastle-on-Tyne.
- The discussions will commence at half-past five o'clock, P.M. There will be no meetings for discussion in July, August, September, or October.

TANKS AND TANK-MAKING.—COMPOSITION OF LIQUID MANURE.

What are we to do with our liquid manure? is a question we have already discussed in a variety of forms, but all tending to show that, except in cases where *irrigation* was practicable, it was not wise nor economical to apply it in the shape of liquid. We well remember the rage there was for tanks and tank-making some twenty years ago—the birth-time of agricultural improvements in this country—and yet we hardly see one of them in proper use at this moment. They are nearly all diverted from their proper purpose; and so unsettled does the question remain, that, after a multitude of essays and papers of great value, the Highland and Agricultural Society of Scotland still presents the same form of heading for a premium on the subject.

We have demonstrated over and over again that the conveyance of water by the liquid manure cart will not repay the cost. The raising and discharge by hose or tubes are processes by far too complicated and expensive for farm purposes, while distribution by power seems still more questionable.

The best remedy seems to be pouring the liquid upon compost heaps, and so, by repeated saturation of the soils of which they are composed, keep up the full supply of manurial matter till the whole of the parts valuable for plants is absorbed and detained by the soil and the decayed matter of which such heaps are composed. But even this involves trouble. Besides, the inevitable carting of the waste material, the scraping up, the mixing, the pouring out of the liquid, the watching of the tank, are all operations likely, in a season of active farming life, to be more or less neglected. While, in a wet season, the compost matter will be so liable to be overcharged with wet of one kind or another, that it may not be a willing absorbent at all, and the liquid will run off in all directions.

Now we must first consider a little, what we have to do. We have the most valuable parts of the manure—the soluble—washed out from the rest, but in proportions so small, to the water which conveys them, that the liquid, as such, is hardly worth the cost of carting, or of removal of any kind.

We have matters, too, both in suspension and solution—some which the water carries mechanically, and some chemically away—and yet there are those who have so often seen applications of the liquid residuum of the farmyard do so little good that they express doubts if it is really valuable.

The researches of Professor Johnston on this head are very instructive. As chemist to the

Highland Society, he gave the following as the result of his investigations “On the Composition of Liquid Manure:—

“The liquid manure of our farmyards is now attracting more general attention than at any former period, and tanks for collecting it are in course of erection in various parts of the country. Both theory and experiment show this liquid to be very valuable as a manure, and it has been long known to contain substances fitted in a marked degree to promote the growth of plants. Still, no analyses, so far as I am aware, have hitherto been made of the liquid in the state in which it actually exists in our farmyards, in too many cases running to waste.

“It was with much satisfaction, therefore, that I received, a few months ago, two bottles of liquid manure for analysis, from Mr. Houldsworth, of Coltness, near Hamilton, a member of our association. This gentleman had drawn up, for distribution among his tenantry, a very satisfactory and useful statement in regard to the value of this liquid, and the gain which would accrue from saving it. But before circulating this paper, he was desirous of having the actual liquor of which he spoke carefully analyzed, and he therefore forwarded it to the laboratory of the association. The examination has led to some interesting results, which I think deserving of general publication.

“1st. The liquid contained in the first bottle consisted of the drainings from heaps of cow-dung exposed to rain. It was dark coloured, and, of course, contained only what rain-water is capable of washing out of such dungheaps. It was neutral, but ammonia was given off when it was boiled, or when quicklime was added.

“An imperial gallon of these drainings, when evaporated to dryness, left about 480 grains, or an ounce weight, of dry solid matter.

This solid matter consisted of—	Grains.
Ammonia . . . . .	9'6
Organic matter . . . . .	200'8
Inorganic matter (ash) . . . . .	268'8
	<hr/>
	479'2
The inorganic portion consisted of—	Grains.
Alkaline salts . . . . .	207'8
Phosphate of lime and magnesia, with a little phosphate of iron	25'1
Carbonate of lime . . . . .	18'2
Carbonate of magnesia and loss . . . . .	4'3
Silica, and a little alumina . . . . .	13'4
	<hr/>
	268'8

“From this analysis, it appears that the rain is capable of washing out much valuable matter from common cow-dung. The ammonia is not so large in quantity as in many other forms of liquid manure, because most of those substances voided by the cow which are capable of producing ammonia pass off in its urine. But, on the other hand, the urine of the cow contains no phosphates, while these washings contain a considerable proportion. It thus appears that the washings of the dungheaps contain other valuable substances besides those which are present in the urine.

“Those therefore, who, besides allowing the urine from their byres to run to waste, permit the rain to wash their dungheaps, suffer a double loss; they lose the ammonia-producing substances and much alkaline matter in the urine, and the phosphates with a large additional portion of alkaline matter in the washings.

“2nd. The second liquid consisted of the drainings of farmyard dung when watered with cows' urine. It was also neutral, but gave off ammonia copiously when boiled, or when mixed with quick-lime.

“An imperial gallon, when evaporated, left 617½ grains of dry matter, considerably more than the former liquid, and this matter consisted of—

	Grains.
Ammonia.....	21.5
Organic matter .....	77.6
Inorganic matter, or ash.....	518.4
	617.5

“We see here that the relative proportions of organic matter in the two liquids were very different. From ordinary farmyard manure there is, as we should expect, less of the organic part dissolved by water than from the finely masticated and digested excretions of the cow.

“The inorganic matter contained in this liquid consisted of—

	Grains.
Alkaline salts .....	420.4
Phosphates of lime and magnesia .....	44.5
Carbonate of lime .....	31.1
Carbonate of magnesia and loss .....	3.4
Silica, and a little alumina.....	19.0
	518.4

“In this liquid, therefore, as in the other, there was a considerable proportion of phosphates, as well as a large amount of alkaline salts. There are no phosphates in the urine; but the fermentation of the dungheap, caused partly by the watering with the urine, decomposes the straw, and other substances which form the dungheap, brings a portion of the phosphates they contain into a soluble state, and thus enables them to be washed out by any watery liquid that comes in contact with them.

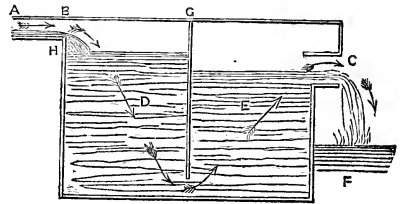
“The urine of the cow, therefore, which has been thrown upon the dungheap, will pass off, if it is allowed to escape, richer than it was at first. It may not contain so much ammonia, or of those substances which produce ammonia; but it will carry away more of those inorganic substances which enter into the composition of our crops, and which are no less necessary to their growth.”

The above evidence gives, beyond all doubt, the real character of the liquid drainings of the farmyards, and we now come to the possibility of detaining the valuable parts of this manure without the cost of so much carting and attention.

The question, however, is one much broader, and more extensive than as applied to mere fold-yard drainage. It applies to the sewage of the largest town as well as the smallest farmstead, and the principle is in both cases the same.

The energy and benevolence of Lady Frankland Russell, of Thirkleby, near Thirsk, has settled the question, by the adoption of a detaining apparatus at Aylesbury, which, while it deodorises the water issuing from the drain, and purifies the foul stream, so as to be made fit to drink—it is so clear and beautiful—provides for the detention of the manure without care or watching.

The drainage of a town is just an exaggeration of that of a farmstead. The following is a section of the tank adopted.



Here A B G is the surface of the ground, and F the stream into which the drain A B C falls. Two tanks are put down, D and E, communicating at the bottom, and the tank E discharging below the drain mouth at B H. The tank D is filled with pounded clay, the tank E with peat charcoal.

The drainage is thus forced upwards through the peat charcoal by hydraulic power, and through the pounded clay by its gravitative power, and the one and the other deodorise and detain the manuring parts, and allow the water to flow out pure. There are two systems of tanks on each side of the drain, and the stream is alternately turned into one and the other as they are emptied respectively; at the point B, a flood drain following on under the surface, so that the mere flood water may be sent over and not through the tanks.

It will at once be seen that the force, as well as the saturation, are brought to bear on the detaining influence; and so completely successful is the plan, that we are informed the Aylesbury authorities are about to purchase the whole, put up, as we have seen, at the sole expense of Lady Frankland. Now why should not farmers have similar tanks, to render the manure portable and concentrated, instead of being dissipated through thousands of gallons of water?

It may be remembered that the detailed trials of the Yorkshire Agricultural Society with peat charcoal were not favourable. But the charcoal was not saturated. It was satisfied with liquid manure so far as wetting is concerned, but vast quantities might have been forced through it and come out pure, so that it was a very weak solution.

We shall feel it our duty to give in a subsequent number some evidence of its being valuable in the hands of truly practical persons, and in the mean time would suggest that the experiment might be tried in any quarter for a very small expense, and we doubt not a valuable manure would be the result.

#### A COMPARISON BETWEEN THE HARVESTS OF 1851 AND 1852.

Sir,—In a recent letter I directed your attention to the necessity of harvest statistics, of something by which the people of this country should understand their real position as to the supply of food. Hitherto we find out any serious difference at the eleventh hour, and then there is a scramble to get the deficiency filled up. Commercial arrangements previously entered into, in ignorance of the real state of the harvest, become either unprofitable or ruinous, from the effect that all produce must bend to high priced food.

Several agricultural papers have stated that our past harvest of wheat is deficient; that the potatoes are materially less than last year. The *Mark Lane Express* and *Economist* have merely stated the fact, without entering into details. Now I have put together a few figures, in order better to understand the matter. According to Mr. McCulloch, the wheat grown in the United Kingdom is as follows:—

England ..	15,200,000	Seed off 2,171,229 ..	13,028,571
Scotland ..	1,225,000	„ 175,000 ..	1,050,000
Ireland ...	1,800,000	„ 300,000 ..	1,500,000

The same authority assumes the potatoes grown in 15,578,571

England as worth	£10,000,000
Scotland .....	1,000,000
Ireland .....	11,000,000
	<u>£22,400,000</u>

Now the wheat is valued at 45s.; but, in order to assimilate the potatoes to wheat, let us divide the above value by a higher figure, and say the potatoes are equal to .....

10,000,000
25,578,571

We have here an average crop equal to .....	25,578,571
The harvest of 1851 is admitted to have been remarkably productive one for wheat, &c., and estimated at 10 per cent. above an average. ...	<u>2,557,857</u>

Total estimated crops of Great Britain (in addition to this quantity, we have required and obtained from foreign countries several millions more) ..	<u>28,136,425</u>
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Now what is the result of the harvest of 1852? Let us take the same basis as previously .....

In quantity and quality very different from the preceding harvest, and estimated at the lowest, 5 per cent. below an average .....	<u>778,925</u>
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Taking the potatoes &c. ....	10,000,000
And deducting for disease and loss at 20 per cent. ....	<u>2,000,000</u>
	<u>8,000,000</u>
	<u>22,799,643</u>

By this there is a deficiency of nearly five millions and a half quarters from the previous harvest; and I believe I am understating the loss in potatoes and the deficiency in the weight of the wheat when thrashed out.

But the mischief does not end here. A large extra consumption is going forward, which the empty condition of all our grain warehouses demonstrates. I find the extra consumption of sugar this year to be 10 per cent.; and, as the same cause which promotes the one must affect the other, I will put down the extra consumption of breadstuffs to be five per cent., so that we shall have 1,500,000 quarters more to find than last year; and, taking the average of the last two years, we shall require a foreign importation of several million quarters in excess of the very large one of last year. The question now is, how can that large supply be obtained? From the census returns of the United States we find the crop of wheat for 1850 was 11,000,000 quarters; and, as this represents about the average crop, we must see that very little towards filling up such a gap as the above can be produced thence. Moreover, besides the English wants, there are many extra demands upon her breadstuffs. The present prices ruling in the States prove clearly that, if we want grain or flour, we must be prepared to meet a strong competition from other countries; and the Americans themselves are also consuming more this year than probably they have ever done previously.

From France we are not likely to receive any assistance: in fact, it appears that some large purchases of grain had been made for that country. France, within the past twelve months, has largely increased her consumption of breadstuffs, principally owing to a better condition of the labour market, but assisted by the very low prices which have prevailed within the past year. On looking over some French statistical works, I find that, owing to the great abundance of the three harvests (1849, 1850, and 1851), the price of food in Paris has been lower than for any three consecutive years since 1787. With all this most favourable state of things, France could not export more than 1,600,000 quarters in any of these years; and the question now is, with the deficient harvest of this year, what will she require to import?

From countries bordering on the Mediterranean there appears very little expectation. Naples has just prohibited the exportation of the lower qualities of food.

A great fallacy is entertained by many, just now, about the British farmer getting a better price for his grain. As above stated, if his crop is less by ten per cent. than last year, it is clear that what he gets in price he loses in quantity.—*Liverpool Courier*.



## ANNUAL REPORT OF THE WOOL TRADE.

LIVERPOOL, JANUARY 1ST.—The state of the wool trade throughout the past year has been in the highest degree satisfactory; employment has been plentiful; and both importers and consumers have found profitable scope for their enterprise. Considering the moderate prices of all kinds of provisions and the very low rates of interest, it is, indeed, matter of surprise that wool has not more engaged the attention of the capitalist, as there have been opportunities where unemployed funds might have met with a good investment. As regards the general trade of the country the year 1852 may, perhaps, be considered the most universally prosperous on record; throughout its course there has been an unbroken current of healthy feeling, unchecked by political or commercial convulsions, which have so frequently occurred before; and there is a strong desire among men of business against any interference with the commercial policy which has been established of late years, and has now been subscribed to by the highest authorities in this country. As the system has been more developed its soundness has become more apparent; it is to be hoped that our example will not be lost on foreign nations, and that they may see their own advantage in pursuing the same course. The home demand for woollen goods has been unusually large; and it is undeniable that a great improvement has taken place in the condition of the labouring classes, while, at the same time, pauperism has considerably diminished, so that the bulk of the population, with increased means at their command, have greatly added to the consuming power of the country, and to this cause, chiefly, we ascribe the present prosperous state of our trade. The export of woollen and worsted goods has been on a very extensive scale, even exceeding the year 1831, the highest rate ever before attained; and, from the enormous amount of emigration which has taken place, and still continues, an increased demand may be expected; besides, the numbers who are flocking to Australia and the means of profitable employment which await them there, will make them very large consumers. During the first three months of the past year there was a very animated demand for wools, and most descriptions advanced 10 per cent., but, as the clip approached, prices receded to about the same extent, and until October were marked by little variation; since then they have been steadily looking up, but it is only during the last month that any decided advance has taken place, and at present they may be quoted, on the average, about 15 to 20 per cent. above the corresponding period last year; and for all lower descriptions of foreign as well as Scotch are about equal to the year 1839, if anything rather below, while for combing (English, &c.) on the average, 2*l.* below; and for colonial and other fine wools, notwithstanding the advanced rates obtained, still much short of the rates current at that period. The prospects of the trade are as promising as could be desired, and on a thoroughly sound basis. We consider present prices are fully warranted by the large scale of consumption of the past three years, which it is well known has far exceeded the growth; and it is roughly estimated that equal to an additional clip of home wool has gone into consumption during that period, which is quite sufficient to account for the diminished stocks we hear of on all hands.

The total import shows a trifling excess over the previous year, but not to an extent to call for any particular remark. The export of foreign and colonial has been rather less; but,

on the other hand, the shipments of home wools have been much larger, showing an increase of upwards of 80 per cent.

AT STRALIA.—Although the arrivals have been rather retarded, they have come forward more freely than, under the circumstances, the most sanguine could have expected. The quantity disposed of up to the close of the last sales in London, ending 10th November, having been 132,183 bales against 119,726 bales in 1851, and the stock now in importers' hands about 22,000 bales against 12,000 bales at the same period in the former year. The first public sales took place in February; 13,198 bales have been offered, and the stocks in dealers and consumers have become exhausted, an advance of 1*d.* to 1½*d.* per lb. was obtained. At the May and June sales, 24,297 bales were disposed of under some excitement, on the part of the home trade as to further supplies, in addition to which, the operations for export were very considerable, which cleared an advance of 2*d.* per lb. At the next sales, in July and August, the quantity was 53,571 bales, which being so much larger than was expected, seemed to allay the fear previously entertained on this head, and the trade operated with caution, as there was every prospect of an abundant supply at the succeeding sales, at the same time the demand for the continent being limited, a decline was established of 1*d.* to 1½*d.* per lb. At the last sale of the year, in October and November, the quantity submitted to competition was 41,617 bales; the home trade being almost the exclusive purchaser at 1½*d.* per lb. advance. Since then some has been done, privately, at a further advance of 1½*d.* per lb., and the prospects of the trade warrant the expectation that the next public sale, the last in the season, probably in February, will go much higher, as the quantity is not expected to exceed 35,000 bales, both in first and second hands. Considering that Yorkshire is the great seat of consumption of Australian wools, and that the trade is now, in a great measure, dependent on these colonies for supplies, it is not surprising that the schemes for promoting emigration on a large scale, with a view of preserving the flocks, should have met with hearty sympathy there, although in some cases, perhaps, rather reluctantly conceded, from the opinion that the statements were exaggerated. We believe, however, the prospects are sufficient to excite serious alarm, and the difficulties seem threefold, each of itself sufficiently formidable. First, as to clipping—In the vicinity of the ports this may be accomplished, although with greatly increased cost; but at places far distant it will be much more difficult to obtain labour, as it takes place at the season when water is plentiful, and therefore very favourable to the gold washings, which afford much more lucrative employment. Secondly, from the exorbitant rate of wages and carriage, the rate for one hundred miles exceeding even the value of the wool. And, lastly, the increasing difficulty of shipment; it is known that wools were shipped as late as last January, and up to the latest dates there was no advice of the vessels having been able to get away. The occupation of gold digging is laborious, and requires a large supply of animal food, which forms a small item of expenditure where money is so easily acquired; the consumption is, therefore, likely to be very considerable; at the Mount Alexander Diggings alone it is estimated that 25,000 sheep are slaughtered weekly, the fleeces of which are left on the ground to rot, not being worth the cost of transport; and the waste in this district alone is equal to 200 bales weekly! With

such facts as these it is difficult to form an opinion as to future supplies; at any rate, it seems certain that they will be spread over a much larger period, instead of, as in former years, the arrivals chiefly taking place within a few months.

**CAPRINO OF GOOD HOPE.**—Wools continue to improve, although generally there is much to be desired as regards evenness of classification, and more attention should be paid to judicious crossing, with the object of promoting more uniformity of quality in the flocks. At the present time, when so much uncertainty prevails respecting future supplies from Australia, these suggestions are the more deserving of consideration. We believe there is a wide field for profitably extending the growth, which, during the past year, exhibits an increase from Algoa Bay alone of one million pounds weight, and the high estimation in which some of the most approved flocks from this district are held is sufficient proof that the colony is capable of producing fine wool, which should stimulate greater exertions to remove the prejudice which, not without cause from the great irregularity too frequently observed, attaches to this description.

**GERMANY.**—From the increasing demand that now requires the whole growth to meet her own wants, and excepting the finer qualities, suited to the west of England, and lambs for the hosiery trade, and fine flannels, it is no longer an article of regular inquiry.

**SPANISH AND PORTUGAL.**—The finer qualities have been in fair demand at prices in proportion to colonial and other similar descriptions; but medium qualities, in good condition, have been chiefly run upon, and have always commanded extreme rates; for both kinds there is at present a ready sale. During the last three months there has been great inquiry for black wools for the fancy trade, and prices have advanced considerably. Moulain Oporto has met with ready sale, at prices in proportion with the lower kinds of English wools, for which they are required as a substitute; the demand still continues, and there is no stock whatever.

**UNITED STATES.**—Although the growth is rapidly increasing, their own wants have more than kept pace with it; and they have even required additional supplies from other quarters; we nevertheless look forward eventually to large receipts from this quarter.

**BUENOS AYRES AND RIVER PLATE.**—We are happy to say that the anticipations we expressed twelve months ago have been fully realized. The receipts have been much more than double those of the previous year, including a large portion of Cordova. They have, generally, met with ready sale, the only exception having been the most burry kinds, which are at all times the most difficult to dispose of at their market value. It is a very important feature that the home trade have been induced at length to turn their attention to the better conditioned parcels of Mestizo and Merino, and we think the demand likely to extend, which will give a more fixed value to the article. Notwithstanding the increased receipts, the quantity retained for home consumption has been larger than for many years past.

**PERUVIAN AND ALPACA.**—On the aggregate there is a falling off of several thousand ballots; but of Alpaca there has been a slight increase. The consumption of the article is extending; the demand has been uniformly good, at advancing prices. We are, at present, quite without stock, and sales could be freely made for arrival at our quotations. Sheep's wool has met with ready sale at current rates; at present the stock is confined to 700 ballots, held at prices rather above the market.

**EAST INDIA.**—It is with satisfaction we notice the large increase from this quarter, which we ascribe to the pacification of Sindh and the adjacent districts. This article has become so

necessary for the lower kinds of goods, that any falling off in receipts would be seriously felt; and, if the quantity were increased to three times the present extent, it would still meet with ready sale. On the whole, these wools are classed with great care, and such marks uniformly command better prices in proportion than those where less attention is bestowed.

**RUSSIA.**—The total receipts show a falling off of some thousand bales, there having been an increased consumption, both in Russia, as well as in Austria and Italy. Of Merino and Metis (scoured), as well as of brook-washed wools, there is an extremely scanty supply; they are at present very much sought after. Donskoy fleece, autumn, and lambs are all in good demand, and all kinds would readily command present quotations.

**MEDITERRANEAN.**—Most kinds have generally met with very ready sale, and at present there is a very considerable inquiry for all descriptions, particularly for those of long staple; but we are entirely without stock.

**EGYPTIAN** wools, for well classed and regular parcels, extreme prices have been obtained; but they are not got up with such care as formerly, being too often mixed with inferior kinds, and, consequently, the marks are not held in the same estimation, which the system of selling to arrive, without warranty of quality, has tended to increase.

**MOHAIR** has been in regular demand at advanced prices, and, at present, is much sought after, and would readily command our quotations. The prospects for this article are favourable, and prices are likely to be higher.

**MOCADOR** has met with ready sale, although the prices, in some cases, have not been satisfactory to the importer. Sandy and inferior parcels are the most difficult to move but good-conditioned wools are at all times saleable at their value, and, at present, much wanted.

**ICELAND** has been in good demand, and sales have been made at full market rates of the day. A considerable quantity has arrived at outports, which has been disposed of much below the current rates here; but a great portion was sold previous to arrival.

**DOMESTIC WOOLS.**—Owing to the large consumption of English wools, stocks are reduced to a lower rate than they have been known for many years, and what is left in growers' hands is held much above market rates. For Irish wools the export demand has been very uncertain; on the other hand, the home trade has consumed a much larger quantity than usual; and, at present, are prepared to pay higher prices than they will command for export. *Scotch Wools.*—Good parcels of white Cheviots have always met with brisk sale, but both laid Cheviot and laid Highland have for several years past been much neglected, and prices had reached a point much below the value as compared with other descriptions; during the last few months, however, there has been a considerably increased demand, owing to the scarcity of other kinds, and they continue much sought after. Stocks are found to be much smaller than was expected, as there has been more attention paid to produce white wools.

The receipt of SHEEPSKINS has only been to a small extent. There has been considerable inquiry, particularly for fine qualities, which are readily saleable at full prices.

HUGHES & RONALD.

**THE HOP DUTIES.**—A parliamentary paper was issued on Friday, showing how often in each year, from 1800 to the present time, the payment of the hop duties has been deferred to what periods, and on what securities. It appears that from 1800 to 1818 the payment of the duty was not deferred beyond the time allowed by law—six months. In 1819 it was deferred

until the 1st of September, 1820, upon security under bond. In 1820 the payment was deferred upon similar conditions till the 1st of September 1821. In 1821 it was deferred for a more lengthened period, viz, till the 10th of October, 1822. In 1822 the payment was deferred in the first instance till the 1st of September 1823; then it was further postponed to the 18th of October; next, the whole duty was postponed to the 1st of April, 1824; and finally, one half the duty was remitted and the payment of the other half deferred till the 30th of November, 1824. In 1823, 1824, and 1825 there was no extension of the legal credit. The duties for 1826 were allowed to be paid in three instalments, and those for 1827 in two instalments. In 1828 the payment of one moiety of the duty was postponed to the 10th of October, 1829; and the other half of the duty was further postponed till the 1st of March, 1830. In 1829 there was no extension of credit. One moiety of the duty of 1830 was postponed till the 15th of November, 1831. In 1831 the period of credit was extended by law; and in the five following years there was no extension of it; but in 1837 credit was given for the payment of the first moiety till May, and of the second till November, by direction of the Treasury. In the 10 succeeding years, down to 1848 inclusive, there was no extension of credit beyond that sanctioned by the Treasury directions of 1837. In 1848 the first moiety of the duty, which was payable on the 15th of May, 1849, was postponed to the 15th of October following; and the second moiety, payable on the 15th of November, 1849 was postponed till the 15th of October, 1850; and further postponed till the 15th of November following. Since that year down to 1851, the latest period embraced in the return, which was procured by Sir John Shelley, there has been no extension of credit beyond that sanctioned by the Treasury directions, to which reference has been made.

ALBANY, N.Y., DEC. 25, 1852.

SIR,—I send you a statement of the property left from our canal at this place for 1852, and the amount shipped from hence to the lakes, which will give you some information as to the quantity of our inland transportation.

PRODUCTS OF THE FOREST (Fur, Lumber, Ashes, &c.)

Fur	..... lbs.	74,982	Beards, &c., feet	317,135,620	
Shingles	..... do.	31,436	Timber, cubic ft.	291,714	
Staves	..... lbs.	107,961,289	Ashes	..... bbls.	7,349
Wood cords	.....	8,297			
	Value, in 1852	.....	6,517,526 dol.		
	.. in 1851	.....	5,285,105		
	Increase	.....	1,232,421 dol.		

AGRICULTURE.

Pork	..... bbls.	26,226	Lard, Tallow &c. lbs.	5,181,788	
Beef	..... do.	36,918	Wool	..... do.	4,145,970
Flour	..... do.	1,631,789	Hides	..... do.	315,592
Wheat	..... bush.	1,495,714	Bran and ship		
Rye	..... do.	31,959	stuff	..... do.	19,283,637
Indian Corn	do.	2,931,938	Dried fruit	..... do.	32,622
Corn Meal	..... bbls.	5,456	Cotton	..... do.	36,811
Barley	..... bush.	1,286,678	Tobacco	..... do.	5,295,909
Oats	..... do.	1,513,145	Hemp	..... do.	728,467
Peas & Beans	do.	15,213	Clover & grass		
Potatoes	..... do.	63,299	seed	..... do.	951,126
Bacon	..... lbs.	3,610,377	Flax seed	..... do.	666,175
Cheese	..... do.	2,947,978	Hops	..... do.	98,368
Butter	..... do.	1,216,453			
	Value, in 1852	.....	18,500,771 dol.		
	.. in 1851	.....	15,252,347		
	Increase	.....	3,248,424 dol.		

MANUFACTURES (Domestic Spirits, Oil sweet and Cake Leather, and Domestic Goods).	
Value, in 1852	..... 976,985 dol.
.. in 1851	..... 873,153
Increase	..... 103,832 dol.
MERCHANDIZE.	
Value, in 1852	..... 816,089 dol.
.. in 1851	..... 76,606
Increase	..... 769,482 dol.
MISCELLANEOUS ARTICLES (Live Stock, Gypsum, Lime, &c.)	
Value, in 1852	..... 598,015 dol.
.. in 1851	..... 969,349
Decrease	..... 371,334 dol.
Total Amount for 1852	..... 27,439,186 dol.
Ditto for 1851	..... 22,456,561
Increase	..... 4,982,625 dol.
Total tons, 1852	..... 1,019,307
Ditto 1851	..... 922,710
Increase of tons	..... 96,597
The FREIGHT shipped from here in 1852	
amounted in value to	..... 31,476,375 dol.
Ditto Ditto in 1851	..... 22,862,627
Increase	..... 8,613,748 dol.
Tons, 1852	..... 177,034
.. 1851	..... 135,475
Increase	..... 41,559

The above is only for this port, showing a large increase over 1851. The tonnage for all the ports which are not noticed in this list will add very largely to the above.

Yours, truly,  
B. P. JOHNSON.

THE CORN METAGE QUESTION.

On Thursday, an influential meeting of merchants and corn-factors who signed a memorial, some few months since, calling upon the corporation to reduce the charges for metage of grain, &c., was held at the London Tavern, Bishopsgate-street, for the purpose of receiving the report prepared by the committee appointed at a former meeting. John Masterman, Esq., M.P., took the chair, and expressed his full concurrence in the object of the meeting, for it appeared to him, from the scale of charges for metage contained in the report, that some reduction was necessary, and ought to be carried into effect. A report was read, of which we give the following abridgment:—

“That the total amount of the said two classes of charges for such measurement and portorage, since the reduction was made on the 3rd day of May, 1852, average 4d. per quarter, ex ship, and 2½d. per quarter ex granary. That on the arrival of a cargo of corn in the port of London, the consignee of the said cargo gives to his lighterman, granary keeper, or purchaser, as the case may require, an order on the captain for the delivery of the corn, and the holder of such order then proceeds to the meter's office to procure a sworn meter; upon receipt of which intimation the meter summons to his aid and proceeds with six, seven, and sometimes eight, fellowship porters on board the vessel, to perform the work of unloading the cargo, which is done by three of the porters descending into the hold of the vessel with the meter. That in cases where corn is delivered out of granary, and a city admeasure-

ment is required, an order is given to the buyer, who applies for and proceeds with a meter and three or more porters to the granary. The meter and porters merely fill and strike the bushel and fill the sacks, leaving the remainder of the labour and the delivery to be performed by the granary keeper; and for this metage, ex granary, a charge of about 2½d. per quarter is made. That it is the duty of the master and crew of every vessel arriving at any port of the United Kingdom, to assist in the delivery of all cargoes entrusted to their care, and in the port of London all goods, including even flour, except corn, are delivered by or at the expense of the captain; and it is obvious from this that the practice which has prevailed (however originating) with respect to corn, has imposed upon the merchants and consignees of the city of London a burden and expense which does not of right belong to them, and which has tended and is continuing to divert business from this port; and in fact a very large quantity of corn is now brought to London by railways, chiefly to avoid the heavy charge of metage. That there is no doubt that if the merchants and factors engaged in the corn trade of the city of London were left quite unfettered to make their own arrangements with respect to the measuring and delivering of corn, they could procure responsible parties to perform the whole for 1½d. per quarter ex ship, and 1d. per quarter ex granary. The committee, however, desiring to take an extremely liberal view of the remuneration to be paid for the work done, and having regard to the guarantee afforded by the superintendence of the city of London, recommend that the present numerous charges, amounting in the whole to the before-mentioned sum of about 4d. per quarter ex ship, and 2½d. ex granary, should be reduced to 2d. per quarter on heavy grain, and 1½d. on light grain, ex ship, and 1½d. on heavy grain, and 1d. on light grain, ex granary, to be paid by the importer or seller, thus avoiding the great expense and trouble of collection from buyers in all parts of the country. That as the result of the manner in which the privileges claimed are carried into effect, a profit income, as the committee are assured, of from £15,000 to £20,000 a year is derived by the corporation, and however meritoriously this annual sum may be applied, it is submitted that the levying of any such impost, even if sustainable in point of law, is wrong in principle, and prejudicial in effect, amounting, in fact, to a tax on the consumers of grain throughout the most populous part of the United Kingdom."

Mr. HALES moved, and Mr. GARFORD seconded, a resolution that the report be adopted, and forthwith presented to the corporation through its proper officer.

The motion was carried unanimously.

Other resolutions expressive of thanks to the committee and to the chairman, &c., were passed, and the business terminated, the observations of the various speakers being limited to an exposition of facts which will be found in the report.

### WHEAT SOWING.

The very prolonged wet season which we have experienced has prevented the sowing of our usual breadths of winter wheat, and the many inquiries made, as to the propriety of sowing wheat now, renders it imperative that we should give some general rules for the guidance of our farmers; so that the country shall not be left wholly dependent on foreign produce.

As a general rule, we are decidedly averse to sowing wheat at the present moment, though, from the mildness and hu-

midity of the weather, if a dry seed-bed could be obtained, grain sown now would very soon vegetate. Still, were we to sow, and severe weather come on after the grain partially vegetates, or not at all, the grain thus sown would, in all probability, rot and perish.

In some dry districts where a dry bed can be secured, and the drainage perfect, wheat may be got in; but, in general, it will be necessary to do so by the aid of spade husbandry, as the land cannot in any case be fit for horse labour. When the land is sound and dry enough, the safest mode will be to sow in beds, and cover from the furrows with spade and shovel. Dibbling is an excellent practice; but it cannot be safely practised if the land be at all wet, as the treading would work up the best soil into an impenetrable, putty-like substance, which would retain the wet on the surface, and prevent the tender blade coming up. But by adopting the plan—sometimes put in practice by gardeners in dibbling-in plants, where the soil is too wet to work upon—of using planks to walk upon, dibbling may be very advantageously proceeded with. In this way two handy boys or girls must work in company, using two planks or boards of sufficient length to cross the beds to be dibbled—one to walk upon while they remove the other. These boards may be nine inches wide, one-and-a-half inch thick, and the same length as the beds are in width, which may be about nine feet, in sound, pervious land. Holes, an inch in diameter, are to be made in the centre of the boards, and four inches apart from centre to centre; the dibble to be somewhat less in diameter, so as to be freely inserted, and at two and a half inches from the point to have a collar, that it may be thrust down only to that depth, which insures the seed being deposited at an equal depth, and at distances of nine by four inches apart, with mathematical precision, without injuriously kneading the soil. As soon as the first board is pierced and sown, the other is removed in advance, and so the work proceeds. The dibble may be made of any sort of hard, close-grained wood, and if any of the holes remain open after the seed is dropped in, then a little fresh earth scattered over the beds from the furrows by the shovel, finishes the operation.

The following information relative to the weight of the animals exhibited at the Smithfield Club Cattle Show came too late for our last publication, or they would have appeared in the Table we then presented to our readers:—

Lord Soude's shorthorned ox, purchased by Mr. Mason, of Queen-street, King's-road, Chelsea, weighed 196 stone, the hide 14 stone, and had 24 st. 4 lbs. of fat. Mr. Overman's sheep, numbered in catalogue 229, weighed 19 st. 3 lbs., and had 13 st. of fat.

Prince Albert's Hereford ox, purchased by Mr. Turner, of Sheffield, weighed 183 st. 6 lbs., and had 31 st. of fat. Mr. Townley's (Townley Park, Burnley) shorthorned cow, weighed 177 st. 2 lbs., and had 35 st. 4 lbs. of fat.

Mr. Sharp's (Henley-on-Thames) three Hampshire wethers purchased by Mr. Walker, of High-street, Hampstead, weighed 62 st. 1 lb., and had 61 lbs. of fat.

Earl Radnor's Hereford ox, purchased by Mr. Stimpson, of Wandsworth, weighed 173 st. 4 lbs., and had 29 st. 2 lbs. of fat.

ERRATUM.—In our tabular statement of the weight of animals exhibited at the Smithfield Club Cattle Show, we gave the weight of fat of the Scotch ox purchased by Mr. Mann, of Croydon, as 37 st. 1 lb. It should have been 22 st.

METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.		WIND AND STATE.		ATMOSPHERE.			WEAT'R.	
Day.	8 a.m. in. cts.	10 p.m. in. cts.	Min.	Max.	10 p.m.	Direction.	Force.	8 a.m.	2 p.m.	10 p.m.	
Dec. 23	29.78	29.78	36	40	38	Easterly by S.	lively	cloudy	cloudy	cloudy	rain
24	29.77	29.78	38	52	50	S. Westerly	brisk	fine	cloudy	cloudy	rain
25	29.68	29.76	43	50	45	W. S. W.	brisk	cloudy	sun	cloudy	dry
26	29.76	29.48	42	50	48	S. by West	rising	cloudy	sun	cloudy	rain
27	29.06	29.48	48	48	45	W. S. W.	strong	cloudy	fine	cloudy	dry
28	29.51	29.80	38	45	39	W. S. W.	gentle	fine	sun	fine	dry
29	29.80	29.63	33	48	48	South	high	fine	cloudy	cloudy	rain
30	29.81	30.05	46	52	46	S. West	lively	cloudy	fine	fine	dry
31	30.13	30.14	39	51	45	S. West	lively	fine	sun	fine	dry
Jan. 1	30.13	29.96	45	51	48	S. West	fresh	cloudy	cloudy	cloudy	dry
2	29.90	29.80	47	52	47	S. West	fresh	cloudy	cloudy	cloudy	showery
3	29.68	29.85	44	50	37	W. Southerly	gentle	cloudy	sun	fine	rain
4	29.70	29.50	37	48	48	S. Westerly	strong	cloudy	cloudy	cloudy	rain
5	29.63	29.70	40	50	40	W. S. W.	gentle	fine	sun	fine	dry
6	29.70	29.65	37	48	37	W. S. W.	high	fine	cloudy	fine	rain
7	29.33	29.41	36	51	39	W.S.W.,N.W.	brisk	cloudy	cloudy	fine	rain
8	29.36	29.47	36	47	40	S. by West	lively	fine	cloudy	fine	dry
9	29.69	29.76	36	47	40	Westerly	gentle	fine	sun	fine	dry
10	29.70	29.31	39	48	48	S. West	v. brsk	cloudy	cloudy	cloudy	rain
11	29.54	29.64	36	47	47	W. by South	strong	fine	cloudy	cloudy	showery
12	29.64	29.40	46	53	48	S. West	high	cloudy	cloudy	cloudy	rain
13	29.40	29.33	45	47	39	S. S. W.	lively	cloudy	sun	fine	dry
14	29.70	29.80	36	47	39	W. by N.	gentle	fine	sun	cloudy	dry
15	29.41	29.40	37	46	39	Westerly, var.	lively	cloudy	sun	cloudy	rain
16	29.40	29.10	35	43	39	S. by E.	lively	cloudy	sun	cloudy	rain
17	29.17	29.50	35	41	35	N. by West	lively	cloudy	fine	cloudy	dry
18	29.78	29.95	35	43	31	N. by West	lively	fine	sun	fine	dry
19	29.96	29.90	30	49	44	S. West	rising	cloudy	cloudy	cloudy	small rain
20	29.55	29.72	44	51	43	Westerly	lively	cloudy	cloudy	fine	dry
21	29.55	29.31	41	50	37	Westerly	var.	cloudy	cloudy	fine	rain
22	29.50	29.75	32½	42	35						

ESTIMATED AVERAGES OF JANUARY.

Barometer.		Thermometer.		
High.	Low.	High.	Low	Mean.
30.77	28.89	52	11	36.1

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
46.3	36	41.15

WEATHER AND PHENOMENA.

Dec. 23.—Overcast; some scudding rain 24.—Finer day; double strata of clouds, the lower rapid. 25.—Morning windy; lulling. 26.—Fine till 3 o'clock, then change; drizzle. 27.—Night stormy till day-break. 28.—Clearing; crimson sunset. 29.—Windy; some rain; red sunset. 30 and 31.—Improving; some sun at the end.

LUNATION.—Full moon on the 26th, 1 h. 10m. afternoon.

Jan. 1, 1853.—Double row of rapid clouds. 2.—Showery. 3.—Finer; cool. 4.—Totally wet, after a night's rain. 5.—Fine cheerful day. 6.—Fine early; a drenching shower about 3 p.m.; clearing in west. 7.—Drenching, with fierce wind; lull, and clearing about sunset. 8.—Some sun; calm afternoon. 9.—Sunny and drying. 10.—Totally

wet. 11.—Fine forenoon; shower; brisk, fine night. 12.—Rainy; afternoon windy. 13.—Cirro-stratus; white crossing rays from the west before sunset. 14.—Fine forenoon; then overcast. 15.—Wet; clouds passing off before sunset. 16.—Wet till evening. 17.—Drying, with some sun; coloured cumulus masses. 18.—Frost; clear, with lunar halo. 19.—Wind rises. 20.—Wind all night; whitelunar halo. 21.—Drizzle. 22.—Fine lively day. LUNATIONS.—Last quarter, 2nd day, 9h. 54m. p.m. New moon, 9th day, 3h. 53m. p.m.

REMARKS CONNECTED WITH AGRICULTURE. The land which for five or six years (1847 to 1852) had been dry at bottom became deeply and thoroughly saturated and drenched to a vast depth, according to quality. Here, upon gravels, chalk, and sand, floods have not been seen; but a fall of rain amounting to 37 inches, at a low average, has compensated the deficiency. At length—though without a scale of ice—a clearing keen wind (north or a point to east) has arisen since the 22nd inst., which yields the first promise of a real melioration. I dare not report the actual condition of stock or of agricultural progress; but no fears of consequence are expressed.

Croydon, Jan. 22nd.

J. TOWERS.

## CALENDAR OF HORTICULTURE.

## PLANT-HOURS.

*Conservatory.*—Every week will add fresh attractions to this structure. The Chinese Azalea will become more plentiful, and, as a contrast to these, the various forms of the *Acacia* will come prominently forward, while *Hya-cinths* and other bulbs, which before the new year usually present very short stems, will now show their full-sized blooms, supported the proper height above the pot or other article it may be growing in; while several species of the *Cytisus* and *Coronilla* will vie with the *Camellia* in the display they make. Certainly they cannot equal the handsome foliage and gay colours of the latter flower, but they all tend to the general blaze of beauty which the early spring months treat us to. If the house admits of a choice of station, let the stove plants have the warmest end; the *Begonias* and other plants from them will be too tender to endure a temperature below 45 degrees; consequently the house must be kept up to that height if there be any important plants of the above section there. Water will have to be more freely administered, and by-and-by some slight syringing of the foliage of Orange and other trees when not in flower. The aphides, which breed so rapidly when there is a warm congenial atmosphere and suitable food, for which the tender young shoots of the Orange form a ready and agreeable repast—whenever these pests show themselves, fumigating with tobacco must be had recourse to, and, as the season advances, this must be frequently done, otherwise much injury will be caused. Remove from this house all plants becoming unsightly, and replace them by others coming into bloom in the other structures—sub-idiary to this one; and maintain that neat, clean appearance, which is in itself no bad substitute for floral display. Fires will be constantly wanted now, and admissions of air on all favourable occasions, in order that the interior may be kept as pure as possible; at the same time avoiding all cold currents, which the tender foliage of many of the occupants here will be unable to bear. Water sparingly in dull weather, except over the heating places, but let nothing suffer for want of it; and New Holland plants in pots require a good deal of water even in winter.

## FORCING DEPARTMENT.

*Vineries.*—A sweet moist heat is here required to stimulate the regular breaking of vines that have not yet started, as well as to encourage the more forward ones which may be coming into full leaf; let, therefore, the heating contrivance be so arranged as to give forth that nice moist atmosphere so congenial to young and tender vegetation. The difficulties of obtaining this moisture are neither many nor great: the heat proceeding from an old brick flue may be modified by placing iron trays, pans, or boxes, on its top, to be filled with water; even a series of flower-pans may do as well as anything, the object being to have a large surface of water for the heated air to act on. Fermenting matter inside the house is also useful, and many other contrivances may be adopted with more or less success. See to vines that are intended for the last crop; let them have full exposure, unless in very severe weather, which seems unlikely to come. Let all, however, that are empty have a thorough good cleaning, which may be done in the wet days we have been so liberally treated with lately. Vines in pots will require water as they progress in growth, and occasionally liquid manure may be applied in a clean state.

*Peach Houses.*—The directions given last week will

still apply. Keep increasing the heat to those out and advancing in growth, and disbud gradually as they require it, nipping out all gross shoots where not wanted, so as to encourage the more healthy ones where well placed and of suitable strength. Trees now in bloom must have abundance of air whenever it can be admitted, in order that the setting process may go on, with that assistance which only Nature can furnish. The latest house will now be in flower; in fact, many trees on the open walls are near to bursting, the mildness of the weather, &c., having so far forwarded their growth, that their remaining stationary for some time is both wished for and probable. But those in the house must be pushed on apace; about 60° may be the maximum fire heat for the forward st house, and for the second some 10° or more less: those in bloom may be less still.

## FRAMING DEPARTMENT.

In dull weather everything must be done to prevent the ravages of damp destroying young seedlings where the heat supplied is from dung or similar fermenting matter. Keeping the glass perfectly clean, having the inside of the frame, especially the under-side of the lights, smooth and clean, so as to allow the condensed vapour to flow evenly down the bars to the bottom, and thence out, will prevent drip in a great measure, which is one of the greatest enemies we have to tender seedling plants from tropical climes. Keep up a lively heat by lining, to such *Cereus* and *Melons* as were planted out some time ago, and are now progressing, and turn and prepare dung and leaves for making fresh beds, as well as soil and compost for the same; the latter ought to be kept in the dry, and ought to be taken there some time before using—in fact, all composts for the potting-bench or hotbeds ought to be kept in winter in some airy place, where the wind—and it might be the frost—might have access to them, but not the wet. Make up fresh beds for such after-crops as require attention now, and put in a succession of French Beans to second those now advancing—about four seeds in a 9-inch pot is sufficient, or they may be struck all together in a pan or box, and planted out into pots afterwards when they get their first rough leaf. Sow pans of Celery for early use, and where there is convenience of glass a slight bed might be made up for Carrots, and other crops wanted early, which, though not often allowed the luxury of a glass covering, are yet nevertheless much benefited by it.

## FLOWER GARDEN.

Let all additions and alterations here be assiduously carried out, so that the important work of the spring be not impeded by an accumulation of the unfinished work of the winter left to be accomplished then. If there be yet beds of *Calceolarias* and *Verbenas* standing unhurt, as there are with the writer of this Calendar, batches of cuttings from each may be taken off and struck, the latter in heat, the other in a cool moist place, as a cold frame where not exposed to currents of cold drying winds, and such beds may be also worth some covering or other, as they will likely survive the winter, and flower so much earlier than those turned out early in May. We have saved whole beds of *Calceolarias* by sticking boughs of ever-greens amongst them and occasionally over them, and *Verbenas* may be done the same. About April the prevailing dry N.E. wind is often as destructive to these

and other plants as the winter's frost, and they consequently look rusty and bad; but they speedily recover, and become the principal ornament of the garden in this early season. Solitary plants scattered over the ground may be similarly treated, which remark also applies to such tender plants as have escaped the winter hitherto, and are thought worthy of trying to save. Fuchsias may likely escape without the injury to their tops, which in other seasons occasions their being cut down; but the advantage of letting them stand is of less consequence than many imagine, as they do not flower any earlier; certainly, when fine large specimens are wanted, it is advisable to retain the shoots of the past year; but some plants we have, several years old, with quite a tree-like character, do not flower any sooner than the same kind (*Riccartonia*) does when cut down, we having repeatedly tried them together.

#### KITCHEN GARDEN.

Take every advantage of the weather to finish the digging and other ground work that may have been delayed by the wet weather, and on all frosty mornings or dry days wheel out dung or other compost to such squares as are vacant; ground intended for early crops, as onions, &c., which had been rough digged or ridged in autumn, may be dug or pointed over on frosty mornings, and laid level so that the atmosphere may have a month or more to act upon it before sowing time; this is especially necessary on such ground as retains the moisture very much, or is of an adhesive unkind working soil. Sow Lettuce and Cauliflower on some prepared bed to which a slight heating material has been applied; then, by being covered with glass for a time, well nurse up plants to replace those the rains and dull weather of autumn have destroyed. Take up Parsnips that may be remaining in the ground if the worms and other enemies be likely to prey upon them; besides, the mild weather has induced a growth which must be injurious to them, by abstracting those stored up juices on which their merits as an article of food so much depend. Jerusalem Artichokes are more slow of growth; but Beet, Salsafy, Scorzonera, and other roots of a like kind, ought to be taken up now, if not before, and stored away in some cool cellar, or other suitable place. Attend also to stores of Potatoes, Carrots, and other things, which we suppose are kept cool and dark; while Onions and other bulbs ought to be kept dry and airy, though certainly not warm, otherwise a growth takes place inimical to their well keeping.

#### ORCHARD AND FRUIT GARDEN.

Finish the pruning of Apple, Pear, and Filbert trees; the latter are pruned with a severity unknown to other trees, in those counties where they are grown to the greatest perfection; the Kentish orchardists cutting and training their trees into a form much like the ribs of an umbrella when inverted, with a slight projecting stem of about a foot high, and around which the earth is all drawn away early in autumn, and left so all winter, the roots being bare in order to check the production of suckers, so fatal to the production of good fruit. All gross shoots are also cut away, and often in summer; but if not, they are so now. And such, instead of being cut with the knife, are done in rather a rough manner with the saw; this is done in order to check or prevent a similar growth from the same place another season. Gardeners would do well to take a lesson here betimes; for although it is not applicable to stone fruits in general, on account of the gumming and other disasters attending rugged amputations, yet in many instances it might be useful by diverting the current sap into channels where wanted by checking it where not.—W.

#### REVIEWS.

THREE YEARS WITH THE DUKE; OR, THE PRIVATE LIFE OF WELLINGTON, AT PARIS, VIENNA, WATERLOO. By an ex-Aide-de-camp. Saunders and Otley, publishers, Conduit Street.

The author of the above work had the good fortune to accompany the late Duke to Holland, Brussels, Paris, and Vienna, at the most exciting period of that hero's career; and with the best taste, the most consummate tact, and the deepest feeling of affection, has produced a volume which will (we venture to predict) be read by all classes. In a literary point of view, it possesses considerable merit; but the greatest charm is the ease and truthfulness which abounds in every page. It shows Wellington not alone as a successful warrior, but as a most generous and kind-hearted man. The anecdotes are most graphically given; now grave, now gay. Here we see the "conqueror of conquerors" absorbed in that contest which decided the fate of nations; here we find him in social intercourse with all around him, encouraging every species of harmless recreation; now leading an army to victory; now leading a wild boar, stag, or foxhunt. The recollections introduce other great characters who took part in the events of those times, and a more interesting work has not issued from the press. We are surprised that the author should withhold his name; his pages reflect equal credit upon his feelings and literary talent. We recommend a perusal of it to all classes.

#### MUSIC.

THEY BRING GAY FLOWERS TO DECK THEE NOW.

THE WORDS BY MISS CULLEY. THE MUSIC BY MISS FAZERKERLEY, OF YELLEBRAND HALL. London: Duff and Hodgson, Oxford-street.

Since the publication of Mrs. Stowe's "Uncle Tom's Cabin" various songs have appeared, suggested by the events related in that interesting work, and prominent among all, the heroine, "Eva," has formed a most graceful subject for the poet and musician; but though many of these songs are pretty enough, not one has so completely and effectually won its way to our favour as that now before us.

"St. Clair saw her as in a dream, while she placed in the small hand a fair Cape jessamine, and with admirable taste disposed the flowers around the couch."

Such is the passage which has suggested to Miss Cully lines we regret our want of space does not permit us to insert. St. Clair, mourning by the couch of his dead Evangeline, and the thoughts passing through his mind while "he saw her as in a dream," are most truthfully and beautifully expressed. The air to which the words are set may indeed be called a spirit-melody—so tender and plaintive, with that wailing, mournful, yet sweet strain of melody pervading it, so adapted to the subject. We heartily recommend this song, feeling confident that if sung with taste and pathos, and that the pauses and expressions, so judiciously marked, are properly and carefully attended to, this beautiful air will be as fully admired and appreciated in the musical world, as the work from which the subject is taken has been in the literary.

POULTRY MANIA.—The unprecedented sum of £100 has just been paid by Mr. Stainton, veterinary surgeon, of Holloway, a well known amateur, to Mr. Fletcher, of Kenington, for his celebrated Cochin China cock. This fowl obtained the first prize and extra medal at the Birmingham Poultry Show in 1851, and a cockerel and pullet bred from him took a first prize at the Great Metropolitan Show, and sold at the auction for £49 7s.

## AGRICULTURAL REPORTS.

## GENERAL AGRICULTURAL REPORT FOR JANUARY.

The long-continuance of unusually wet and unseasonable weather has been productive of the most serious inconvenience in the agricultural districts. This must be evident when we state that, since the 5th of August, 1852, we have not had seven consecutively fine days. In all parts of the country, therefore, labour is in a most backward state; and for many weeks the progress of ploughing and sowing was wholly arrested. It would be impossible for us to point out the numerous evils which must result from the present position of affairs; but it is placed beyond a doubt that it will be absolutely necessary for the farmers to devote a larger portion of their at present uncultivated lands to other purposes than that of wheat growing. On light soils, a good portion of the wheats have been sown, but the appearance of the plants is very sickly and unpromising. On the heavy lands, scarcely a fourth of the wheat has been got in, and that in very bad condition. In many localities, large quantities of produce have been completely spoiled, from the heavy rains and inundations; and we need scarcely remark that very few really fine samples of grain have made their appearance at the various markets. The growers had anticipated an improved quality and sample about this time; hence numbers of them refrained from threshing out, knowing that a better quality would produce more money. Up to the present time, however, their hopes have been completely blighted, and millers have, consequently been compelled to purchase largely of foreign grain to make anything like a good quality of flour. Most of the new wheats continue to show unmistakable signs of a bad harvest; we are here particularly alluding to those grown in the Midland and Southern counties. North of the Humber, however, the general sample is turning out a good one, both as to weight and colour; but the range in prices elsewhere is still a wide one. Towards the close of the month, the wind shifted round to the northward and eastward; hence several large patches of wheat and barley were sown in different parts of England; but much yet remains to be done ere agricultural business can be considered sufficiently forward. The emigration mania has taken away a good portion of our farm-labourers, and it threatens to withdraw a large additional number from our soil. The effect can scarcely be calculated upon with anything like accuracy; but it is clear that labour will eventually become scarce and dear.

The crop of barley grown in this country, last year, is proving large in quantity; but many of the samples are deficient in quality and weight. However, it is clear that the total yield is considerably in excess of 1851. For most kinds the demand has been active, and fine malting parcels have realized high figures. Oats are turning out well; but the yield of both beans and peas is miserably deficient; hence heavy imports of those articles will

be absolutely necessary. Very little old English wheat is now to be met with; and the stocks of foreign are greatly reduced.

Notwithstanding that we have had very unfavourable weather, the health of both beasts and sheep has continued good. Very few losses have been sustained, if we except rather a heavy mortality amongst the early lambs: the fall up to the present time has been a good one. The quantity of available food on most farms is still large; and the turnip crop, from its extent, has proved a great boon to the graziers.

The hay and straw markets in the metropolis have been extensively supplied; nevertheless, a full average business has been transacted in them, at very full prices. Meadow hay has sold at from £2 15s. to £4 4s.; clover do., £3 15s. to £5; and straw £1 5s. to £1 13s. per load.

As might be expected, considering the backward state of ploughing, an unusually small amount of business has been transacted in guano, the imports of which have been under 2000 tons. The stocks here are very moderate, and Peruvian is still quoted at from £9 to £9 5s. per ton. In English wool, the demand for which for shipment to the Continent and the United States has been active, a larger business has been reported, at an advance of fully 0½d. per lb. Foreign and colonial qualities have ruled steady, at extreme quotations. The next series of colonial wool sales at which about 35,000 bales will be offered, is appointed to commence on the 10th February.

In Ireland and Scotland the corn trade has been steady, at full quotations, although the supplies on offer have been on the increase. Prices have slightly improved. Out-door farm labours, from the weather having been more propitious than here, are not to say backward. We understand that the available supplies of beasts in Scotland are considerably in excess of many former seasons.

## REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Notwithstanding that the imports of foreign stock into London have been on a liberal scale for the time of year, arising, in a great measure, from the openness of the weather on the continent, great firmness has been observed in the trade. Consumption has to an extent exceeded the supplies of home-fed stock; hence prices have continued to advance. This is a state of things we have long since predicted, because it is evident that in many parts of the country grazing has been conducted on a false principle. We will take for instance the breeding and rearing of sheep. In former reviews, we have contended that the system of getting rid of large additional numbers of young sheep must, at one period or another, tell upon the available supply of stock in the country. We have been met with the observa-



tion that two years' old sheep have paid the graziers better than those of three or four years' old. It may be true that the owners have been in the position to insure quick returns; but did it never occur to them that stock of the age referred to has never carried anything like an adequate quantity of consumable food, considering its weight? Bumped-up sheep, the fat of which is little else than a mass of oil-cake, have certainly never paid either the butcher or consumer, and the system is now beginning to tell fearfully upon the number in the whole of the flock districts. A mere glance at our tabular statements will at once convince the most sceptical that production has not kept pace with the increased demand. No doubt the free admission of foreign stock has had something to do with the falling off in the supplies of English sheep. In the years 1848, 1849, and 1850, the quotations ruled too low to admit of any additional outlay of capital; in point of fact, grazing was carried on at a loss; hence, sheep feeding was partly abandoned in some localities, and our markets were heavily supplied with stock in a miserably low condition. Without confidence in reference to the future, no inducement presented itself to produce animals sufficiently old to be positively useful to any party, and without considering what an increased demand might do, the grazing community unwisely reduced their supplies, and contracted the means of further exertions. In many instances necessity compelled the adoption of such a course, and such was the altered features of the trade that the consumption of oil-cake fell off fully one-half. Since the late important rise in the quotations—the result solely of deficient supplies—great efforts have been made to secure additional numbers of store sheep; but these have been obtained at comparatively high figures, and thus rendered it a matter of doubt to many parties whether they will fully repay the outlay. Now when we consider that nearly the whole of the working classes are fully employed, and that money is very abundant and cheap, and further, that it would be impossible to import such a number of foreign stock as would materially depress our markets, we arrive at the conclusion that the value of both beasts and sheep has not yet seen its highest point.

In Smithfield the general demand has ruled active, and prices have steadily improved. Amongst the stock shown have been 100 oxen from Spain, the loss upon which, owing to a portion of the cargo having been thrown overboard in the Bay of Biscay, has amounted to nearly £400. The stock in question was in fair condition, although it was nearly a fortnight on passage to Southampton. Prime Scots have sold readily at from 4s. to 4s. 2d. Prime Down sheep, 5s.; and prime calves, 4s. 6d. to 4s. 8d. per lb. The advance in the value of English wool—the demand for which, for shipment to the continent and the United States, has become active—and the high quotations offered for hides and skins, have no doubt had considerable influence upon the minds of salesmen and butchers. At the present time, polled sheep-skins are worth from 7s. 6d. to 9s. 6d. each.

The total supplies exhibited in Smithfield have been as under:—

	Head.
Beasts .....	20,717
Cows .....	180
Sheep .....	96,800
Calves .....	2,148
Pigs .....	2,360

	CORRESPONDING PERIODS.			
	Jan. 1849.	Jan. 1850.	Jan. 1851.	Jan. 1852.
Beasts....	16,623	15,553	18,310	17,325
Cows ....	568	442	361	442
Sheep....	93,150	95,560	92,590	102,976
Calves ..	873	1,014	1,178	1,336
Pigs ....	1,185	1,783	2,998	2,515

The general weight and condition of the supplies brought forward have been good, and we may observe that although a few cases of foot rot have been noticed amongst the sheep arrived from the Midland Counties, the health of the stock appears to have been good. Annexed are the highest and lowest prices obtained during the month:—

	Per lbs. to sink the offals.				
	s.	d.	s.	d.	
Beef .....	2	6	to	4	2
Mutton .....	2	6	to	5	0
Veal .....	3	0	to	4	8
Pork .....	2	10	to	3	10

A few lambs have appeared from Dorsetshire, Surrey, and the Isle of Wight, and which have sold at from 4s. 6d. to 5s. per lbs.

	COMPARATIVE PRICES.				
	Jan. 1849.		Jan. 1850.		
	s.	d.	s.	d.	
Beef from....	3	0	to	4	0
Mutton .....	3	8	to	4	10
Veal .....	3	6	to	4	8
Pork .....	3	4	to	4	8
	Jan. 1851.		Jan. 1852.		
	s.	d.	s.	d.	
Beef from....	2	6	to	3	8
Mutton .....	3	4	to	4	4
Veal .....	3	0	to	3	10
Pork .....	2	10	to	4	0

The bullock supplies have been thus derived:—

Norfolk and Suffolk .....	5,800
Northern districts .....	2,000
Other parts of England .....	1,700
Scotland .....	3,084
The imports of foreign stock into London have been:	
Beasts .....	1,693
Sheep .....	9,529
Lambs .....	106
Calves .....	1,509
Pigs .....	10
Total .....	12,547

During the same period in 1852 we received 10,567; in 1851, 9,018; in 1850, 3,220; in 1849, 4,495; and in 1848, 5,485 head.

The supplies of each kind of meat exhibited in Newgate and Leadenhall have been seasonably large; nevertheless the general demand has ruled active, and prices have been on the advance. Beef has sold at from 2s. 2d. to 3s. 6d.; mutton, 3s. 2d. to 4s. 6d.; veal 2s. 10d. to 4s. 6d.; and pork 2s. 6d. to 4s. per lbs. by the carcass.

## REVIEW OF THE CORN TRADE

DURING THE MONTH OF JANUARY.

The weather has been of the most extraordinary character throughout the winter: the quantity of rain which has fallen during the last three or four months has been almost unprecedented, and that this must be felt hereafter can scarcely admit of doubt.

Owing to the very late period at which harvest operations were finished, the preparation of the land for autumn sowing was delayed longer than is usually the case, and comparatively little wheat was sown before October. From the 21st of that month up to the close of the year, only five days were experienced in which more or less rain did not fall; the land therefore became perfectly saturated, and to work it advantageously was impossible. Farmers have, nevertheless, seized every opportunity which has occurred from time to time to forward the necessary labours, and wheat-sowing has in many cases been commenced and finished under very unfavourable auspices. Notwithstanding the utmost exertions on the part of agriculturists, and the advantages which thorough drainage has afforded them, they have been unable to sow anything like the usual breadth, and we are inclined to think that from one-third to a fourth of the land intended to be cultivated with wheat has not yet received the seed. A portion of this will, no doubt, still be brought under wheat culture; but the greater part is likely to be devoted to other purposes, and there is reason to believe that less wheat will be grown in 1853 than has been the case in any preceding season for many years past. Spring-sown wheat is always regarded as a precarious crop; and as there is no temptation to grow this grain in preference to others, wheat having, in fact, been the least remunerative crop of any for several consecutive seasons, farmers will, we think, be inclined, where the character of the soil is suitable, to substitute barley or anything else which they may deem most likely to pay.

The extreme mildness of the winter has encouraged a free growth of the wheat plant, and its present appearance is somewhat rankly luxuriant. This we need scarcely remark is always attended with more or less danger, and the prospects for the future are certainly not of the most encouraging nature. We consider it too early, however, to enter into predictions as to what may or may not take place at so distant a period as the next harvest, and the only point in connection with the future, we deem deserving of notice, is the certainty that

a less breadth of land than usual has been sown with wheat, at the regular and natural period. This has no doubt had some weight, and assisted to cause the rise which took place in prices of wheat in the month of November last. The expectation then generally entertained, viz., that the upward movement would continue, has not been realized; indeed, since the commencement of the new year a portion of the advance has been lost. This reaction can scarcely be accounted for on reasonable grounds, and we are still inclined to think that wheat will increase in value as the year advances. The deficiency of the last wheat crop in Great Britain was certainly not exaggerated at harvest time; indeed, there is every reason to come to the conclusion that the yield in the north—which it was supposed would in some degree compensate for the unfavourable result of the southern harvest—was over-rated, buyers from thence having actually been compelled to come to the southern markets to supply their necessities. The loss of the potato has also been found to be quite as great as feared; and the total deficiency in the produce of food last year, in the United Kingdom, must, we conceive, have been very great. In the absence of anything approaching authentic statistics on agricultural matters, much must be left to conjecture; but there is reason to believe that stocks of all kinds of old corn of home growth were reduced into a narrow compass at harvest time, and that the new produce was almost immediately commenced upon. The probabilities are, therefore, that with a short yield and an unusually large consumption, a greater proportion of the crops of 1852 has been already consumed than is usually the case at the corresponding period of the year, and that very large importations from abroad will be needed between this and next autumn. Under these circumstances it is not, in our opinion, unreasonable to expect that a higher range of prices will prevail during the spring and summer than we have had since the commencement of free trade, even if the seasons should prove propitious; whilst the occurrence of anything threatening to detract from the productiveness of the next harvest might, and probably would, cause considerable excitement. It must, however, be borne in mind that we are open to receive supplies from any and every quarter—that the entire surplus growth of the whole world will be directed to this country if prices rise sufficiently to tempt foreign merchants to consign; and

though we believe that even this fact will not prevent some improvement, still we must acknowledge that we cannot see our way with sufficient clearness to determine whether the supplies from abroad may exceed or fall short of what we are likely to require.

The rise in November induced large orders to be sent out, not only to the Baltic, but likewise to the Black Sea ports, to Egypt, and to America. What was then bought at the nearer ports was partly for immediate shipment; and this supply would have reached us ere now but for the constant gales from the south-west. It is, however, known that a considerable quantity of wheat is on passage; and to this fact we are inclined to attribute the extreme caution which buyers have lately observed in their operations.

The purchases made for spring shipment must, in the aggregate, be very large; but these cannot be expected to reach our shores before May and June.

The importations of foreign wheat into the United Kingdom during the year ending 5th inst. amounted to—3,068,892 qrs. Wheat, 626,737 qrs. Barley, 995,479 qrs. Oats, 371,899 qrs. Beans, 107,016 qrs. Peas, 10,023 qrs. Rye, 1,479,890 qrs. Maize, 3,921,635 cwts. Flour; and in the year ending 5th January, 1852, we imported—3,831,836 qrs. Wheat, 834,491 qrs. Barley, 1,209,844 qrs. Oats, 318,502 qrs. Beans, 100,392 qrs. Peas, 24,612 qrs. Rye, 1,821,573 qrs. Maize, 5,363,478 cwts. Flour.

By far the greater part of these supplies has gone into consumption almost as soon as received; and it is computed that the entire stock of foreign wheat in the granaries of England, Scotland, and Ireland, does not exceed 1,000,000 qrs. The millers and bakers are likewise but indifferently stocked, having for many weeks past bought only from hand to mouth, under the impression that they might perhaps succeed in purchasing cheaper on the arrival of the long-expected Baltic supplies. Our position, therefore, appears to be this—a short crop of wheat and an extensive failure of the potato last year, with no excess in the produce of any other article to make up the deficiency.

The prospects for the next harvest, as far as a judgment can be formed at this early period, are decidedly unfavourable—more moderate stocks of both native and foreign corn than at the same period for some years past, but the prospect of large arrivals during the ensuing spring and summer. Will the latter circumstance outweigh all the others? If so, present rates may not be supported. We are, however, inclined to think that our prices are not sufficiently high to induce very large immediate consignments.

Our usual retrospect of the operations for

the month at Mark-lane will, we fear, offer few incidents of interest, business having been very quiet throughout. During the first fortnight the arrivals of wheat coastwise into the port of London were very small; since then, however, the supplies have rather increased. The very humid state of the atmosphere has caused the greater part of the home-grown wheat to come to hand in wretchedly bad condition, a circumstance to which the languor which has prevailed may be in a great measure attributed.

Really good dry qualities have scarcely varied in value, and have met rather a ready sale; whilst the commoner descriptions have given way in price from week to week. On the 3rd inst., the first Monday in the new year, only a small show of wheat appeared on the Essex and Kent stands; but so rough and inferior was the quality of the greater proportion, that factors had to accept prices 1s., and in some cases even 2s. per qr. below those current on that day se'nright. No further reduction took place until the 17th, when a fall of 1s. per qr. was again in partial instances submitted to; and though prices were not quoted lower on the 24th, the turn was decidedly in favour of the buyer. Fair qualities of new Essex and Kent red wheat might now be bought at 44s. to 45s. per qr., which shows a considerable decline on the rates current at the close of last month.

A circumstance has occurred in connection with the foreign wheat trade which has caused a great deal of talk and excitement. For upwards of twelve months considerable purchases have been made in the Dutch and German markets at prices relatively much above those current in London, notwithstanding which, the goods have been regularly consigned to Mark-lane, and sold on arrival in most cases from on board ship, without any regard to cost price. These operations naturally gave rise to various rumours. At first it was said that the Protectionist party were importing at a loss to keep down prices and cause dissatisfaction among farmers, in order to endeavour to obtain a renewal of import duties. Absurd as this may appear, the report gained a certain amount of credence. Subsequently it was seriously asserted that the Emperor of France, fearing high prices and discontent among his people, had determined to keep the London market largely supplied at any sacrifice, well knowing the influence which prices at Mark Lane exercise all over the continent. This version of the matter gained extensive belief, and the party who was known to be the actual operator (a Mr. Pries) was no longer looked upon with suspicion. His transactions increased in magnitude from week to week, and the forced sales acted very disadvantageously on the market. At last

the bubble burst, and the discovery was made that Pries had all along been the sole concocter and executor of these ruinous speculations. To carry on the same he had, it seems, committed wholesale forgeries, the consequence of which has been the failure of the firm of Collmann and Stolterforth, of whom large advances had been obtained by him on fictitious securities. That this system of importing at a loss has kept prices lower than they would otherwise have been, can scarcely admit of doubt. As yet the market has not recovered from the shock, but as the trade is generally in a healthy state, we feel satisfied that the exposure, and consequent cessation of these dishonest dealings, will benefit the legitimate trader.

The importations of wheat into the port of London were small the first three weeks in the month, owing to the prevalence of contrary winds, but the wind having during eight or ten days become more favourable, about 40,000 qrs. have been received.

Importers have manifested no anxiety to press sales from on board ship, and for granaried parcels very full terms have been demanded, notwithstanding the downward tendency in the value of English. Fair qualities of red have not been offered below 48s. to 50s., and for fine 52s. up to 54s. per qr. has been asked. Prices of Danzig, Königsberg, and similar sorts have been equally well supported, and we question whether the finer descriptions could be bought a penny cheaper than at the close of last month. The town millers have conducted their purchases with great caution, and the country demand has been on a retail scale, but the prevailing belief is that neither the metropolitan nor country millers will be able to hold off much longer, as their stocks are becoming low, and the new wheat cannot be manufactured without a considerable mixture of old foreign.

The operations in floating cargoes have not been on so extensive a scale since the beginning of the new year as they were in either of the two months immediately preceding. Sellers have, nevertheless, insisted on prices similar to those current at the period when the enquiry was most active. The prices last paid for Ghirka arrived off the coast were 47s. 6d. to 47s. 7½d., for Polish Odessa red 46s., and for Ibraila 44s. per qr.

A larger proportion than usual of the foreign supply in 1852 has been from the Black Sea ports; and that a progressive increase will take place in the produce of Southern Russia, &c., now that they are sure of a market in Great Britain, cannot be questioned. A gentleman who has made this branch of trade his study estimates the probable supply from thence during the next twelve months at about 2,000,000 qrs. of wheat. Last year

1,600,000 qrs. were received from ports east of Gibraltar; of which, however, about one-tenth was re-exported to the continent of Europe. The Baltic shipments dwindle into insignificance by the side of these numbers.

The sale for town-made flour has been slow throughout the month: this, however, we do not attribute to a falling off in the consumption of bread in the metropolis, so much as to the fact that all the principal bakers bought freely before the rise which took place in prices in November and December, and have since been in a great measure independent of the millers. Their stocks must, however, be now nearly exhausted, and a better demand is consequently calculated on. Norfolk household flour, which at one time reached the high price of 38s., has since been sold as low as 35s., but can now scarcely be had at the latter figure. The receipts from America have not been large, considering that the wind has been almost constantly favourable for vessels from thence. The dulness in the wheat trade has influenced this article, and the extreme rates current last month have not been fully maintained. Sour American flour may be had at 24s. to 25s., and sweet at 27s. to 28s. per barrel: these rates will not pay the importer.

The arrivals of home-grown barley were very small the first three weeks in January, and though some increase has since taken place, the market has not been by any means largely supplied. This grain has ever since harvest commanded relatively better prices than wheat. Since our last some further rise has taken place in its value, and the demand for the finer kinds has been lively. Fair malting qualities have advanced 1s., and picked parcels fully 2s. per qr.—the latter being now worth 38s. per qr. The great bulk of the supply having consisted of ordinary descriptions, very little, if any, improvement has taken place in quotations of the latter; indeed, inferior dark-coloured samples have hung heavily on hand. Foreign barley has come rather sparingly to hand, but a fair quantity is known to be on passage; buyers have consequently declined to take more than needed for immediate use, and it has been impossible to establish any advance on previous prices.

The malt trade was rather active in the early part of the month, and the best qualities commanded rates not before obtainable. Within the last eight or ten days the inquiry has slackened, but holders have remained exceedingly firm; and, considering the state of the barley market, they are, we think, quite warranted in holding for full terms.

The arrivals of oats have been very small. From the commencement of the month up to Saturday, the 22nd inst., only 26,000 qrs. came to

hand coastwise from Ireland and from abroad, being rather less than the quantity consumed in London and its environs in a single week. During the last few days several cargoes have come to hand from German, Dutch, Danish, and Swedish ports; still the supply for the month falls very far short of what is needed for the consumption. It might consequently have been imagined by those who are not conversant with the London trade that prices would have risen materially, but this has by no means been the case. The large dealers have supplied their customers out of their old stocks, and have bought very sparingly in the market. This is the plan they almost invariably pursue, and they certainly manage matters very much to their own advantage. Business has throughout the month been exceedingly inactive, and prices have remained nominally unaltered; though where it has been necessary to sell to avoid incurring demurrage, the buyer has had the turn in his favour. From present appearances we deem a small decline by no means improbable; but when the dealers shall have succeeded in obtaining this advantage they will most likely clear the market, and immediately afterwards advance the price to their own customers.

Good Russian feed-oats are still worth 20s. 6d. to 21s., but light Dutch feed and out-of-conditioned Swedes and Danes might be had relatively cheaper.

The value of English beans has scarcely varied since we last addressed our readers; the mild, damp weather has prevented any improvement in the condition of the new, which circumstance has to a certain extent interfered with the sale; but the quantity brought forward has been too small to allow of buyers purchasing cheaper than before. Egyptian beans have met a steady demand, at the old prices.

The total absence of frost has caused a much less consumption of peas to take place than usual during the winter months, or prices would probably have ruled higher, as the receipts of both English and foreign have been on quite a moderate scale.

Though a large business has on the whole been done in Indian Corn, there has been less activity in the demand for this article than in November and December. The consumption in Ireland does not appear to be quite so extensive as formerly, which is attributed, by those best qualified to give an opinion, to the improved condition of the people in the sister isle, and a consequent increased use of wheaten bread. Meanwhile parties having floating cargoes to offer have remained firm, and we have heard of no sales of Galatz below 35s. per qr., cost, freight, and insurance; and for other kinds corresponding rates have been asked.

The subdued tone of the English advices throughout the month seems to have produced very little influence on prices of grain abroad, and foreign merchants appear to calculate with great confidence on a large demand for corn later in the year.

The weather on the continent has been of a similar character to that experienced here; and as far north as Danzig there has been no impediment from ice to the navigation. Shipments have, therefore, been practicable all through the winter; but the scarcity of vessels, and the high rates of freight and insurance, have acted as a check to much being despatched to England.

Stocks at most of the Baltic ports are not by any means large, and the bad state of the roads (in consequence of the constant rain) has prevented supplies being brought forward freely by the growers. The latest quotations for fine high-mixed wheat from Danzig are 52s. to 53s. per qr., free on board in spring. The exports from thence in 1852 had amounted to 26,496 lasts, of which nearly 18,000 lasts had been shipped to the United Kingdom, and upwards of 8,000 lasts to Holland, leaving only about 300 lasts for other destinations.

At Königsberg prices of wheat have been steadily supported throughout the month. The stock on hand on the 1st inst. was estimated at about 60,000 qrs.; certainly not a large quantity.

From Stettin we learn that very small supplies had been brought forward by the farmers, and that these had been readily taken by the merchants to hold over at prices equal to 45s. to 46s. per qr., free on board, for fine qualities of red.

At Rostock the deliveries from the growers appear to have been somewhat more free, but the demand had been sufficiently active to take off the greater part, and prices had not given way more than about 1s. per qr.

At Stralsund, Greifswald, and Anclam, quotations also appear to have been well maintained; and the same may be said respecting prices at the near ports.

At Hamburg rather large purchases of wheat have been made for shipment to England during the month, leaving but a small stock on hand. The last quotations from thence are, for good 60 to 61 lbs. red Upland, on the spot, 47s. to 47s. 6d. per qr., free on board.

The cessation of the purchases on account of Pries—the party alluded to in the foregoing part of this article—has had some influence in the Dutch markets. The immediate effect was to cause the stoppage of a Mr. Weherteman for a large amount, and business has since been quiet both at Amsterdam and Rotterdam, but prices have not receded.

From France we learn that the supplies of flour

and wheat had about kept pace with the consumptive demand; and, but little having been done for export, quotations had scarcely varied.

The stir here in November and December caused some excitement at the Mediterranean and Black Sea ports, which the subsequent dull reports from hence has not altogether allayed. That large orders were sent out, about the close of last year, to Odessa, Galatz, Alexandria, and other distant markets, there is no doubt; and that a good many of these were executed is also certain; hence we may calculate on receiving considerable arrivals from thence, but these cannot be expected to reach us until the summer shall have far advanced.

In the American markets prices have been too high to allow of much being bought; and it is tolerably evident that it will require a higher range here to induce large consignments from the other side of the Atlantic. The fact is, that the Americans are a large bread-consuming people, and that as their cultivation increases so does the consumption; and we must not calculate on ever receiving much assistance beyond the usual annual export of flour, except we can make it worth their while by high prices.

**CURRENCY PER IMPERIAL MEASURE.**

	Shillings per Quarter	
	44 to 48	fine up to 53
WHEAT, Essex and Kent, white, new...	44	53
Ditto ditto old	45	53
Ditto ditto red, new...	43	46
Ditto ditto old	45	49
Norfolk, Lincoln, & Yorksh., red...	43	48
BARLEY, malting, new	30	32
Chevalier	33	37
Distilling	28	30
Grinding	26	28
MALT, Essex, Norfolk, and Suffolk, new	54	55
Ditto ditto old	52	54
Kingston, Ware, and town made, new	59	60
Ditto ditto old	57	59
OATS, English feed	17	20
Ditto Potato	20	22
Scotch feed	22	24
RYE	28	30
BEANS, Mazagan	33	34
Ticks	34	36
Harrow	35	37
Pigeon	36	40
PEAS, white boilers	37	40
Maple	33	36
Grey	31	33
FLOUR, town made, per sack of 280 lbs.	—	—
Households, Town 40s. Country	—	—
Norfolk and Suffolk, ex-ship	—	—

**IMPERIAL AVERAGES.**

FOR THE LAST SIX WEEKS.

	Wheat.		Oats.		Rye.		Beans.		Peas.		
WEEK ENDING:	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	
Dec. 11, 1852..	42	1	29	9	18	7	26	11	35	4	10
Dec. 18, 1852..	43	10	29	9	18	5	29	2	34	6	32
Dec. 25, 1852..	45	11	29	9	18	6	29	4	34	11	32
Jan. 1, 1853..	46	7	29	8	18	9	29	7	35	0	32
Jan. 8, 1853..	46	0	29	8	18	6	29	1	34	8	32
Jan. 15, 1853..	45	10	29	10	18	7	30	8	34	8	30
Aggregate average of last six weeks	45	0	29	9	18	6	29	2	34	10	32
Comparative average same time last year	37	6	26	6	18	1	27	10	29	1	28
DUTIES	1	0	1	0	1	0	1	0	1	0	1

**PRICES OF SEEDS.**

BRITISH SEEDS.

Lansed (per qr.).. sowing 54s. to 58s.; crushing 45s. to 50s.	
Lansed Cakes (per ton) .....	£8 6s. to £9 10s.
Rapeseed (per last) new £22 to £23, fine £24, old £21 to £24	
Ditto Cake (per ton) .....	£4 10s. to £5 0s.
Cloversed (per cwt.) .....	44s to 70s.
Mustard (per bushel) new, white 7s. to 10s., brown 7s. to 9s.	
Coriander (per cwt.) .....	old 9s. to 12s.
Canary (per qr.) .....	45s. to 47s.
Tares, Winter, per bush, 4s. 6d. to 5s. .... Spring (nominal)	
Caraway (per cwt.) .....	new 46s. to 47s.; fine 48s.
Turnip, white (per bush.) .....	Swede (nominal.)
Trefoil (per cwt.) .....	26s. to 30s.
Cow Grass (per qr.) .....	(nominal) .. 00s. to 00s.

**HOP MARKET.**

BOROUGH, MONDAY, January 24.

We have still a good enquiry for the better sorts of Hops, and for the few remaining on hand there is an advancing tendency. Sound old hops are also required for.

Mid and East Kents .....	95s. to 160s.
Weald of Kents .....	95s. „ 112s.
Sussex Pockets .....	90s. „ 105s.

**POTATO MARKET.**

SOUTHWARK, WATERSIDE, MONDAY, Jan. 24.

Since our last report, the arrivals from Yorkshire and Scotland have been liberal, and a fair supply from abroad, and lower prices have been submitted to with most sorts.

The following are this day's quotations :

York Regents ... per ton	80s. to 140s.
Lincolnshire ditto .....	70s. „ 100s.
Scotch ditto .....	80s. „ 100s.
Do. reds and cups .....	70s. „ 80s.
French whites .....	70s. „ 80s.
Dutch .....	60s. „ —s.

**PRICES OF BUTTER, CHEESE, HAMS, &c.**

Butter, per cwt.	s.	d.	Cheese, per cwt.	Cheshire	50 to 70
Friestland .....	106	108	Cheddar .....	56	68
Kid .....	100	104	Double Gloucester	54	62
Dorset .....	104	110	Single do.	46	54
Carlisle .....	90	94	Hams, York, new	70	80
Waterford ..	88	90	Westmoreland	68	76
Cork .....	86	92	Irish	60	70
Limerick .....	80	86	Bacon, Wiltshire, green	60	61
Stgo .....	80	90	Waterford	58	62
Fresh, per doz.	12	14			

**WOOL MARKETS.**

BRITISH WOOL.

LEEDS, Jan. 21.—There is not any change to report in this market this week. Prices continue firm, with an upward tendency.

LIVERPOOL, JANUARY 22.

SCOTCH.—The demand for laid Highland Wool continues good, but stocks being light, it is difficult to get hold of it in quantity. White Highland is scarce, and much wanted. Cheviots and crossed of all kinds is also in fair request at full prices.

	s.	d.	s.	d.
Laid Highland Wool, per 24lbs.	12	0	13	0
White Highland do.	15	0	16	6
Laid Crossed do. unscathed	14	0	15	0
Do. do. scathed	15	0	16	0
Laid Cheviot do. unscathed	16	0	17	0
Do. do. scathed	20	0	21	0
White Cheviot do. do. do.	26	0	26	0

**NOTICES TO CORRESPONDENTS.**

"A Correspondent," "A Tenant Farmer," "J. Abbott."—The average price of Wheat, Barley, and Oats, for the year ending Jan. 1st, 1853, is as follows:—Wheat, 40s. 11d.; Barley, 28s. 7d.; Oats, 19s. 1d. per qr.

"James Rawlence."—Price of Meat in the London markets from December, 1851, to December, 1852:—Beef, 3s. 2d.; Mutton, 3s. 8d.; Lamb, 4s. 8d.; Veal, 3s. 6d.; and Pork, 3s. 4d. per 8 lbs.











# THE FARMER'S MAGAZINE.

MARCH, 1853.

## PLATE I.

### HEREFORD BULL,

Bred by and the property of Edward Price, Esq., of the Court House, near Pembridge, Hereford.

#### PEDIGREE.

Pembridge by Sir David (349), and Sir David by Chance, dam by Hope (439), g. dam by Old Sovereign (401). Pembridge was calved on the 6th February, 1848.

#### PRIZES.

At Ludlow Cattle Show, Sept. 27, 1848, Pembridge obtained the prize of .....	£5	0	0
At Leominster, Oct., 1848, Cup, value .....	5	5	0
At Hereford, ditto ditto .....	10	10	0
At Hereford, 1849 .....	5	5	0
At the Royal Agricultural Society's Show at Norwich, the first prize in the second class ...	20	0	0
At Ludlow, 1850, the prize in the sweepstakes of .....	3	0	0
Also at the same meeting the first prize shown with four offsprings .....	5	0	0
At Hereford, 1851, first prize in the three-year-old class .....	5	0	0
At the Royal Agricultural Society's Show at Windsor, 1851, the 2nd prize in the 2nd class..	20	0	0
At Ludlow, 1851, the first prize in the sweepstakes .....	9	0	0
At Hereford, 1852, the first prize in the aged class .....	5	0	0
At the Royal Agricultural Society's Show at Lewes, the first prize in the first class .....	40	0	0
At Leominster, with four offsprings, first prize in the first class .....	5	5	0
Total.....	£138	5	0

## PLATE II.

### PLAN OF FARM BUILDINGS.

#### DESCRIPTION OF THE PLAN OF FARM BUILDINGS.

The shape of the farmery is the most approved form in an oblong square, with the front of low walls, and facing the south to east quarter of the heavens, as being the most benign aspect over the whole of Europe. The building will thus be averted from the blazing heats of the noonday and afternoon, and the western storms of wind and rain, and at the same time enjoy the genial warmth of the early morning's sun. The three sides of the square are in two rows of houses, and of the old English style of building, with plain weather boards and projecting eaves. The expense of this  
[OLD SERIES.]

arrangement is small, and the effect very pleasing. The roofs are steep in at least two feet above the rectangle, and covered with slates.

Beginning with the west wing, the first house is the cowshed, which contains the animals in double trevices, and during summer is accommodated with the use of the adjoining yard, in which the cows repose during night, and are fed with vetches and clovers. The feeding cattle are then absent, and the cows use the yard. The calf-house opens into the cowshed by a door, by which the calves are led by halters to be suckled two or

three times a day. Each calf has a single pen, with a box in the corner to hold chalk and rock salt, which will be licked by the animals, and a railed manger on the top of each partition wall, from which the grown calves learn to eat clovers and vetches. The floor is of boards pierced with auger holes, which conveys all moisture into a cavity of one foot underneath, which prevents any presence of dampness. The single pens do not allow an animal to molest the others by sucking the ears or by goring with the head. When the calves are fed with milk from the pail, a slip board in the door of each pen allows the animal's head to reach the pail, suck the milk, and being again shut in, no molestation of any kind happens from the process of feeding. The hay house adjoins, and supplies the cows with hay, and also the riding stable, which, with the gig house, is provided for the accommodation of the dwelling house, which is understood to stand on the west side of the farmery. There is a general house for provender, a house for a bull or stallion, and a roomy spare house, to be used as may be required. The height of the side walls of the wing is 12 feet.

The straw barn occupies the width of the two rows of houses, and affords much convenience for the storing of different kinds of straw. The corn barn stands at right angles to it, and discharges the straw from the steam machinery as it is manufactured. The ricks of grain are placed along the two sides of a railway, which is covered over with a roof of corrugated iron, resting on pillars of cast iron, which saves thatching the ricks, and a slight four-wheeled waggon runs upon the railway, and conveys the unthrashed grain to the end of the barn, and is pitched to the second floor, where the machinery receives it to be scutched. In this way the grain reaches the ground floor freed from the chaff, but requires to be riddled, and afterwards fanned from the light grain, and which forms a subsequent process. The barn may be raised to a third story, on which the machinery works, and to it the sheaves of grain are conveyed from the railway waggon; the thrashed grain, chaffed, comes to the second floor, and is then riddled, and put into fanners, which separates the sound from the light grain, and the former is received for measure and put into sacks. This is the doing of complete work by one operation. A carrier can be driven by the machinery, to raise the unthrashed grain to the third floor at the end of the barn.

A mode may be suggested of placing each single rick of grain on a square four-wheeled platform, which stands on a branch railway at a sharp angle of divergence with the main trunk, along which the entire rick is conveyed to the barn when wanted to be thrashed. This way supersedes any convey-

ances on the railway, and any rick may be thrashed when required, as each branch railway runs into the main trunk.

The cart shed adjoins the straw barn, and has the granary over it, as the side walls of the northern wing of the farmery are 24 feet high. An outside stair (shown in the plan) leads to the granary with the dressed grain to be stored, and must be carried on back—or better, the grain being in bags on the ground floor of the barn, may be pulled by the machinery to the second, and thence conveyed to the granary, both the floors being on a level. But the best granary is the direct sale of grain from the barn to the market. Still, a granary is necessary on any farm, as being sometimes wanted. A locked tool-house adjoins the cart shed, and is floored over with the granary. The stable is included in the north wing, and is roofed over with the granary, from which the feed grains are spouted into a chest in the stable, to be measured out to the horses. The stable is convenient for straw from the barn, and hay from a hay house (as shown in the plan).

The east wing of the farmery contains a feeding house for cattle, tied to stakes in double trevises; a house for hay, and another for roots, at each end, supply these articles as wanted for the animals.

The interior of the farmery is divided into yards for store and feeding cattle, with shelter sheds, forming the inside row of houses in the double wings. A central road of twenty feet in width leads to the straw barn, and affords access to each yard. A large yard for young horses is provided with two sheds, and adjoins the provender house; and a yard for store pigs is much benefited by the rough, strawy, and warm litter from the stable, which being mixed with the saponaceous excrement of the pigs, a very rich manure is produced. In this yard the animals are fed during summer with clovers and vetches; and in winter with raw esculents, as turnips and potatoes. The warm litter of the stable is a very agreeable bed to young swine.

The feeding yards are for two animals, or for four—it is difficult to see what advantage one animal in a box can enjoy over two in a yard—or even over four, when a due assortment is made. Such minutiae do not enter into gross performances; at the same time a large rabble of beasts together must be avoided. The store yards will contain eight, ten, or twelve beasts in each division.

The superfluous litter of the farmery falls from the yards into the cavities on the sides of the central road, and flows to the front of the whole area of building, where it falls through iron grates into a covered drain, which conveys it into a tank on the east side of the farmery, and is there absorbed by fine earths. But in all properly-arranged farming establishments the straw litter will absorb

all the moisture; and after all that has been said and written about liquid manure, the best use of it is by that way.

Every part of the farmery is supplied with water in troughs by ballcocks fed by pipes from casks or tanks placed aloft in the spare house, to which the water is raised by a force-pump from the common sinking in the ground. Or a spring of water on some high ground may send the water to the

tank by pipes below the earth, and which are fed at the fountain-head by a regulated supply. This latter application will depend on the situation of the farmery with respect to higher grounds that contain outlets of water.

The cost of this farmery will be from £500 to £1,000, and somewhat varied by the price of labour and materials.

METEOROLOGY: ITS CONNECTION WITH AGRICULTURE.

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

The conclusion, which was once so reluctantly admitted, that practice and science ought to go hand-in-hand over the farmer's fields, is now steadily becoming more undoubted; and it is fortunate for the great and enterprising farmers of England that it is so; they indeed are the cultivators of the earth, who by their knowledge are best able to discern such truths; they alone are the agriculturists with sufficient energy and enterprise to carry them into the improved cultivation of the soil. If, indeed, there is any young farmer, who yet doubts the value of science to his farm, let him remember what *mechanical* science has done—let him call to mind what the Ransomes, the Howards, and others have done with the old English plough—what the Garretts and the Smythes with Jethro Tull's drill—the Barretts, and other great makers, with the thrashing machine, which a scientific Scotch advocate first constructed, and (omitting to name the noble improvements of many other great implement makers) then let him say if *mechanical* science has done nothing for agriculture. If such a person is asked what chemistry has contributed to the farmer, let him point to the superphosphate of lime, to the salts of ammonia, and to the analysis of soils, and the vegetable and animal productions of the farm. If he is reminded of geology, let him think of the fertilizing mixture of different strata, the fossil bones and coprolites of the crag and the greensand formations. If he is to defend the claims of meteorology, his task will be equally easy; he can refer to its intimate connection with the mode of culture adopted in different districts; the profitable cultivation of particular crops, the sowing of his seed, the gathering in of his harvests. Then again, let him not forget that some late interesting combined researches of the meteorologist and the chemist have pretty clearly shown that there are more foreign substances, mechanically suspended in, or chemically combined with the atmosphere, than was formerly understood; and it is probable from some recent discoveries, that the knowledge of the

presence of ammonia in the air, and from hence deposited on the farmer's lands, may be very profitably rendered available in the application of new and powerful fertilizers, especially to his cereal crops. On this important question I hope, on a future occasion, to speak more at length. Now I propose, in continuation of a former paper (*see ante*, p. 10), to continue my gatherings, and in this little essay to make some observations on the prevailing winds of these islands.

The prevailing winds are of very great importance in viewing the intimate connection which exists between the agriculture and the meteorological phenomenon of a district. The following table gives the prevailing winds during the years 1847 and 1848, at 15 different stations. From this it is noticeable that although the moist and warm S.W. wind is that which prevails in almost all parts of the island, yet that in some few places the dry and cool E.N.E. and S.E. winds prevail, and it is noticeable that these are precisely the most decidedly corn-growing counties of the island.

WIND, AND ITS GENERAL DIRECTION.

	During 1847.		1848. Quarters ending			
			Mar. 31.	June 30.	Sep 30.	Dec. 31.
Helstone .....	S.W.		S.W.		S.W.	S & S.W.
Truro .....	S.W. & N.W.		Variable	Variable	S.W.	S.W.
Exeter .....	N. & E		N.	N.E	W.	N.
Brighton .....	N.E. & S.W.		S.W. & N.E.			
Reckington ....	S.S.W.		S.W.		S.W.	S.W.
Greenwich ....	S.S.W.		S.W.	E.		S.W.
Thwaite .....			S.E. & E.		S.W.	
			S.W.			
Cambridge ....	Variable		S.W.			
Norwich .....			S.W. & Variable			
			N.W.			
Derby .....	Variable		N.W. & Variable			S.W.
			W.S.W.			
Highfield House	S.W.		S.W. & Variable		S.W.	S.W.
			N.W.			
Liverpool .....	N.W.		W.	N.W.	N.W.	Variable
Stonyhurst ....			N.W. & W.S.W.		S.W.	N.
			S.E.			
Whitehaven ..	S.W.		S.W.	S.W.	N.W.	S.W.
Newcastle ....	S.W.		S.W.	S.W.	S.W.	S.W.
(Phil. Mag...)	V. xxiv. p. 271		V. xxiii. p. 517	V. xxxiii. p. 194	<i>Ibid</i> p. 374	V. xxiv. p. 192.

The intimate connection between the amount of rain in England and the prevalence of certain winds was shown by Mr. Luke Howard, (*Climate of London*, vol. ii., p. 204). The following little table is the result of some of his valuable observations during a period of nine years—1807 to 1816.

Years.	Winds.					Rain. Inches.
	N.E.	S.E.	S.W.	N.W.	Var.	
1807....	61	31	113	114	43	20-14
1808....	82	38	108	103	35	23-24
1809....	68	50	123	91	33	25-28
1810....	81	72	78	83	41	28-07
1811....	58	59	119	98	36	24-64
1812....	82	66	93	91	34	27-24
1813....	76	53	92	124	20	23-56
1814....	96	65	91	96	17	26-07
1815....	68	36	121	107	33	21-20
1816....	64	66	106	102	28	32-37
Averages.	74	54	105	100	32	25-18

It is worthy of consideration, as Mr. Howard remarked on the results contained in the table, that there appears to be a close connection between the amount of the fall of rain, and the prevalence of N.E. winds. In the driest of these ten years—that of 1807—the class of N.E. winds was nearly double in number that of the S.E. in 1815—the next for dryness the same; and in 1808, which stands third, rather more than double.

In the year 1816—the wettest season of the ten—the class of S.E. winds exceeds the N.E. In 1814 it has two-thirds of the amount of the latter; in 1812, three-fourths; and in 1810—the remaining wet year—the amount comes within a ninth of the N.E.—both classes being large, and the Westerly winds falling off in a remarkable manner to make room for them. With regard to Westerly winds, the class N.W., we may observe, falls off gradually during the three years following 1807, while the annual rain increases from year to year; and in four of the remaining years its number is above the average in the dry years and below it in the wet ones. There is, therefore, an evident general relation of this class to our fair weather.

The monthly proportion of these different winds in the same period of time—1807 to 1816—was

Month.	N.E.	S.E.	S.W.	N.W.	Var.
January....	6.8	5.3	7.0	9.1	2.8
February....	3.2	4.0	11.7	7.4	1.7
March.....	9.8	5.4	6.6	6.5	2.7
April.....	8.3	5.6	6.0	6.4	3.7
May.....	5.9	6.5	9.0	5.6	4.0
June.....	7.1	3.0	7.2	9.1	3.6
July.....	4.5	2.5	9.5	11.5	3.0
August.....	3.5	2.9	10.2	12.9	1.5
September..	6.4	6.0	8.0	7.4	2.2
October....	5.2	5.0	10.5	7.4	2.9
November..	7.8	3.1	8.8	8.4	1.9
December..	5.0	4.6	9.9	9.7	1.8
Averages..	6.0	4.5	8.7	8.45	2.65

The following table, made by Mr. Joseph Alkum, near Carlisle (*Far. Mag.*, vol. xxii., p. 220), shows the weather experienced in Cumberland during 1844.—(See *ante* p. 249, and *post* p. 256, 264).

	Clear through-out.	Cloudy no Rain.	Rain.	Frost.	Sun shone out.
January....	3	13	15	12	26
February....	0	4	25	21	26
March.....	0	12	19	14	28
April.....	4	13	13	3	27
May.....	3	19	9	4	31
June.....	0	14	16	0	26
July.....	1	8	22	0	29
August.....	2	6	23	0	31
September...	0	15	15	2	28
October....	1	12	18	7	31
November..	1	11	18	7	24
December....	6	20	5	25	20

The next table from observations on the wind, made at Carlisle, shows the number of days in which the wind blew from the east and from the west.

	1843.		1844.		1843.		1844.		
	E.	W.	E.	W.	E.	W.	E.	W.	
Jan.	6	25	6	25	July	7	24	10	21
Feb.	16	12	13	16	Aug.	12	19	7	24
Mar.	18	13	8	23	Sept.	11	19	18	12
April	8	22	4	26	Oct.	6	25	15	16
May	20	11	22	9	Nov.	14	16	18	12
June	18	13	9	21	Dec.	6	25	28	3

The following table, constructed from the observations of Smeaton, the celebrated civil engineer, will show to the farmer that the force which the wind occasionally exerts on his stacks and buildings is much more considerable than is commonly believed. This table also shows the very great resistance offered by the air to common and railway carriages (*Brande's Dict.*).

Velocity of the Wind in Miles per hour.	Force on One Square Foot, in lbs.	Common Appellation of Force of such Winds.
1	.005	Hardly perceptible, Gentle, pleasant wind.
4	.079	
5	.123	
10	.492	Pleasant, brisk gale.
15	1.107	
20	1.968	Very brisk.
25	3.075	
30	4.429	High wind.
35	6.027	
40	7.875	Very high.
50	12.300	
60	17.715	A storm.
70	31.490	
80	49.200	A violent ditto

The following table gives, col. I., the weeks ending during the three harvest months, in 1847; II., the general direction of the wind; III., its greatest pressure, in lbs., on a square foot; IV., its mean pressure for the week; and, V., its amount in miles, of horizontal movement during the week, at Greenwich (*Jour. Sta. Soc.*, vol. ii., p. 88) —

	I.	II.	III.	IV.	V.
July 3	.....	N.E.	3·0	0·1	980
„ 10	.....	S.W.	3·5	0·0	830
„ 17	.....	W.S.W.	1·8	0·0	455
„ 24	.....	Variable.	3·0	0·0	550
„ 31	.....	Variable.	1·5	0·0	610
Aug. 7	.....	Variable.	3·7	0·1	800
„ 14	.....	S.W.	2·5	0·1	925
„ 21	.....	Calm.	2·0	0·0	625
„ 28	.....	Variable.	4·0	0·1	590
Sept. 4	.....	W.	5·0	0·2	1100
„ 11	.....	W.S.W.	1·3	0·0	720
„ 18	.....	W.S.W.	12·0	0·8	1505
„ 25	.....	S.W.	5·0	0·3	1200

These laborious researches in one field of science will well repay the young farmer's repeated study. These facts—these step by step enlargements of knowledge—let him clearly understand, are solid stores of knowledge, patiently and laboriously as-

certained and registered by those whose labours, carried on perchance in solitude, and uncheered even by the tardily meted out encouragement of their countrymen, are all available for his guidance. Let such a student of agriculture refer to the pages of one who long since laboured in the cause of the farmer, in ignorance of the facts of modern meteorology; let him open the volume which the great Jethro Tull bequeathed to after ages, and when he glances over the 3rd and 4th chapters of "The Horse Hoe Husbandry," which treat of "the food" and "the pasture of plants," he will see how, after making the invaluable improvements which have immortalized this great farmer—when he attempts to explain them *scientifically*—how wretched are his deductions, how false his conclusions!

EXPERIMENTS WITH SPECIAL MANURES ON THE GROWTH OF TURNIPS.

The adaptation of manure to the exigencies of the soil and the crop is a point which requires more judgment than perhaps any one process in cultivation. On this special experiments must be made on almost every farm, and the results will prove of a very valuable kind—for those farms as regards their soils, and for the whole kingdom as respects the crop. Hence we are always glad to receive experiments, because, when carefully made, and accurately subjected to the bushel or the scales, it is impossible not to derive benefit from the process.

We have been favoured by Mr. T. C. Johnson, of Chevet—the winner, it will be remembered, of the prize for the best cultivated farm twenty-five miles round Doncaster—who expended an equal sum in several kinds of artificial manure, which was sown on the land that had been previously manured with twelve cubic yards of farmyard manure per acre. The soil was a hazel loam, on grit stone, and is in a very high state of cultivation. The manures were all selected by a money scale, and twenty-five shillings worth per acre of each kind was applied. The turnips were drilled on the 2nd of June,\* 1852, and were weighed on the 28th of December following.

The manures applied were seven, and the plots numbered as follows:—

- No. 1. Superphosphate of lime, from Mr. Pearson, of Leeds.
- No. 2. Prepared bones, from ditto.
- No. 3. Nitro-phosphate, from Mr. Simpson, of Walton.
- No. 4. Peruvian guano, from Mr. Pearson.
- No. 5. Raw bones, from Mr. Hodgson.

- No. 6. Blood tillage, from ditto.
- No. 7. Another sample, from ditto.

Equal parts of the land on each plot were weighed—the one selected at the east, and the other at the west end, so that a fair average might be obtained. The result was as follows on the west end:—

No. 1. Turnips weighed.....	60·11
No. 2. „ .....	75·08
No. 3. „ .....	70·08
No. 4. „ .....	65·04
No. 5. „ .....	59·01
No. 6. „ .....	66·07
No. 7. „ .....	72·08

At the east end the weights were as under:—

No. 1. Turnips weighed.....	70·05
No. 2. „ .....	86·04
No. 3. „ .....	86·08
No. 4. „ .....	64·02
No. 5. „ .....	77·10
No. 6. „ .....	73·05
No. 7. „ .....	69·06

The mean of these two weighings, when reduced to tons per acre, stand as below. We will repeat the kind of the manures, so as clearly to give in one view the relative advantages of each kind on the weight of the turnips per acre.

	Tons.	Cwt.	Qrs.
No. 1. Superphosphate.....	16	8	0
No. 2. Prepared bones .....	20	4	2
No. 3. Nitro-phosphate.....	19	13	0
No. 4. Peruvian guano .....	16	3	2
No. 5. Raw bones .....	17	1	3
No. 6. Blood tillage .....	17	12	2
No. 7. Do. ....	17	15	0

We do not happen to have by us the exact mode by which these bones, which caused the highest quantity of bulbs per acre, were prepared, but we

\* 2nd July.

can easily ascertain from Mr. Pearson. We believe they were merely disintegrated, either by fermentation, or by Mr. Blackhall's steaming process. The next in order is Mr. Simpson's nitro-phosphate, which has done such wonders on the wheats grown upon the chalk lands of the East Riding of Yorkshire; and Mr. Johnson informs us privately that, had not the plants been a little deficient in one plot on the west end of the field where this manure had been applied, he thinks it would have been the highest; as it is, it will be seen, it falls little more than half a ton per acre below that point.

Another important fact is also taught by this experiment; that is, the value of nitrogenous manure being applied to the soil. The mere super-phosphate is almost one-fifth below the highest weights; while the raw bones, which would not readily give off their ammonia, is but half a ton per acre better. The blood tillage is, we infer, so prepared as to prevent its giving off its nitrogenous constituents very freely, or is mixed very largely with non-nitrogenous matter. We are the most puzzled with the guano standing the lowest on the list as to produce of turnips, because we generally see it have a most wonderful effect upon them. Nor will the very equal quantities per acre in each case admit of any great waste of plant. It may have been that the *price* of the best Peruvian guano allowed so small a quantity per acre; but this quantity, which would be about 2½ cwt. per acre, with twelve tons of manure, ought to have been ample to produce all the turnips the land was capable of growing.

We may add in conclusion a word of caution, moreover, against single weighings. The plots are not in any case quite equal, and the guano, though the most so, presents a difference in various parts of the field. Thus in the east end of the field the nitro-phosphate and the prepared bones were nearly equal, while the raw bones were the lowest at the west end of the field, and the highest but two at the east. These are anomalies which always occur in nature, but they show how carefully weighing should be made in a field where the results are sought for with great accuracy.

The mean result, however, is clearly in favour of the principle of phosphoric acid and nitrogen being necessary to the growth of good turnips.

We are always glad when any of the facts and principles we enunciate attract the observation or even the animadversion of our correspondents. Discussion is never so well bestowed as when investigating some agricultural point; and the light thrown on the subject, the interest excited by it, and the minds set to work through it, must have a

beneficial tendency. A writer, who signs his name "Critic," (see page 231,) comments somewhat freely on the fact of Mr. Johnson's (of Chevet) turnips weighing so little as 17 tons 16 cwt. per acre, when, in fact, Mr. Caird spoke of his farm as very highly cultivated, and he arrives at the conclusion "that there is defective culture, and the absence of the observant mind that directs the husbandry of Lois Weedon."

Now we know no reason why Mr. Johnson's name is brought into juxtaposition with that of Lois Weedon's at all, unless it be to run down a "practical man" to the exaltation of a "scientific." A little consideration will soon set the matter right, and show that no such conclusion can be come to with any degree of fairness. Mr. Johnson's was an experimental plot, and as such, every one knows that experimental plots are usually less productive than even the rest of the farm; the delays, the weighing and measuring of the manures, and the changes made from one to another, often tend to lose the moisture so necessary to the turnip, and cause a loss of plant, which, we are assured, was in some degree the case in Mr. Johnson's experiment; and as some of them answered and others failed, it was fairer and more generous to have taken the largest produce as the test of Mr. Johnson's farming, viz., 20½ tons per acre.

Now, this is not bad produce—it is one of which Mr. Johnson has good right to be rather proud than ashamed. It may be remembered that the Annandale Farmers' Club has for three years made perambulations on some 36 good Scotch farms, and weighed the results, which were as follows for the years 1849, 1850, and 1851. The kind of turnips were the yellows, and therefore fairly represent Mr. Johnson's variety of turnips:—

	Per imperial Acre	
	Tons. Cwts.	
In 1849 the average weight was	.....	20 7
In 1850       "       "	.....	19 14
In 1851       "       "	.....	17 0

Mr. Johnson, therefore, is in good company amongst the intellectual practical Scotsmen in the beautiful vale of Annandale, in his experiment; and this should be borne in mind by "Critic."

We have been reminded, *not* by Mr. Johnson himself, but by a neighbour, that we have made two mistakes, either from the manuscript, to which we cannot now refer, or owing to a misprint. The date of Mr. Johnson's sowing was the *2nd of July*, and not the 2nd of June. The manure applied with so much success for wheat in the East Riding of Yorkshire, was Simpson's ammonia phosphate, and not the nitro-phosphate as we before stated. And now a word for the comparison with Lois Weedon. It so happens that swedes are selected



by "Critic," but the Scotch experience always shows a difference of some three tons per acre in weight between yellows and swedes, in favour of the latter :

	Tons. Cwts.	
In 1849 the difference was . . . . .	1	14
In 1850 " " . . . . .	4	15
In 1851 " " . . . . .	2	16

or an average of 3 tons 1 cwt. more of swedes per acre than of yellows.

"Scotchmen," therefore, "will say" that Mr. Johnson stands very much on a par with themselves in turnip growing.

We do not happen at this moment to remember the history of the land at Lois Weedon, which produced 27 tons of swedes. Was it the field "broken up from pasture" seven years ago, by Mr. Smith, on which he had five crops, the last of which might reach 40 bushels per acre? Mr. Johnson's farm has so such peculiarity, and is all old-going land.

We have heard of clerical and other cultivators, who grew large weights of turnips on very unpromising subsoils, wherewith to feed their flocks; but we will venture, having seen Mr. Johnson's farm ourselves, to back him year after year for as many good acres of turnips as can be found either at Lois Weedon or any other locality, and not on newly broken-up pasture, but on old-going land, and not very deep of soil naturally, lying somewhat too near the rock to "bring up six inches of subsoil" below the seven inches of staple.

We certainly think the tone and animus of "Critic's" observations rather calculated to check than encourage gentlemen to give their experience, and the public the benefit of their experiments, which are so very valuable; and therefore we regret the tone of his remarks.

The turnip controversy, as it was called, which originated in Mr. Matson's remarks, many years ago, seems likely to be recommenced. But we shall find that so long as there are variations of moisture, of rain, and of temperature, we can never expect to see the same amount of turnips grown in any two districts.

Much less fair is it, evidently, to take a single trial, and that an experimental one, to found observations on a practical man's farming. If any remarks are to be made on Mr. Johnson's farming, it must not be on an isolated field, but on his whole farm; and taking this as a test, it will bear a comparison, we will venture to say, with that of almost any other in the kingdom; but to compare garden allotments with it is illusory and preposterous.

We again invite practical men to send us their experiments, and if they object to have their names published, we shall be glad to keep them within

our own escritoir, having no wish for personal remarks to be the result of public communications.

While on the subject of Mr. Johnson's experiment on manure, we may mention that we have heard from Mr. Pearson an account of his mode of preparing the bones which were so favourably reported on. The article consists, he says, chiefly of bones and sulphuric acid, with ammonia, in a form readily taken up by the roots of plants. When the bones are treated with sulphuric acid, steam heat is used to quicken the operation, which has the effect of producing a large proportion of soluble phosphate and drawing off much of the water. Mr. Pearson thinks that the manure, in the case of the Peruvian guano, was in much too close proximity to the seed, and that there was a loss of plant from this and the peculiarity of the season. The guano was a fine sample, containing 18 per cent. of ammonia, and only  $1\frac{1}{2}$  of silica.

#### CULTIVATION OF TURNIPS.

SIR,—Having noticed in your paper, of the 31st ult., a letter signed "Critic," in reply to a leading article in your paper of the 24th ult., respecting the useful and interesting experiments made by T. C. Johnson, Esq., Cheviot Grange, near Wakefield, I beg to observe in rejoinder that it is just possible that even in some parts of Mr. Johnson's farm 35 tons per acre have been grown, as "Critic" must be aware that even what may be called "strong soils" will not produce such a good crop of turnips as a fine loam, because that particular soil may not be adapted to their growth. Probably "Critic's" friend did not "top and tail" his turnips as Mr. Johnson did, and that would add some tons per acre more in weight.

We know very well that on many farms some parts may be peculiarly adapted for the growth of a certain description of crop, whilst other parts are not so, and this occurs almost on every farm in England and Scotland. Mr. Johnson seeded in July, and not June, as stated in "Critic's" letter and the article in question.

Probably "Critic" will inform us why he selects one solitary little patch at Lois Weedon as an instance of the prolific growth of turnips in juxtaposition to that upon a farm which he has probably never seen; and this without giving a description of Mr. Smith's soil, which may be altogether different from that of Mr. Johnson's, but for some reason or other Lois Weedon seems to be "Critic's" pet spot.

I consider, Mr. Editor, that you are rendering good service to the cause of agriculture by opening your columns to this subject, as agricultural experiments carefully conducted, like that of Mr. Johnson's, which he had adopted for two years, show at least that he is possessed not only of good sound practical sense to carry the matter out as he has done where so many experiments were made in one field and adjoining each other; and it is to be hoped that other farmers in England will follow the same example, and not depend upon the mere eyesight of a "Critic," as all agricultural experiments should be tested in the bushel and the scale.

—Mark Lane Express.

CRICKET.

## ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A MONTHLY COUNCIL was held at the Society's House in Hanover-square, on Wednesday, the 2nd of February. The following Members of Council and Governors of the Society were present:—Lord Ashburton, President, in the chair; Lord Southampton, Sir Robert Price, Bart., M.P., Mr. Raymond Barker, Mr. S. Bennett, Mr. Bramston, M.P., Colonel Challoner, Mr. Druce, Mr. Gadeston, Mr. Garrett, Mr. Brandreth Gibbs, Mr. Grantham, Mr. Fisher Hobbs, Mr. Hornsby, Mr. Jonas, Mr. Kinder, Mr. Lawrence, Mr. Milward, Mr. Mainwaring Paine, Professor Sewell, Professor Simonds, Mr. Simpson, Captain Henry Vyner, Professor Way, Mr. Jonas Webb, and Mr. Woodward.

William Crosskill, Esq., of the Iron Works, Beverley, Yorkshire, was elected a Governor of the Society.

The following new Members were elected:—

Anderson, George, Walton-on-Thames  
 Anderson, David, West Nanen, Carnaustie, Forfarshire  
 Barrett, John, Milton House, Abingdon, Berks  
 De Trafford, Sir Humphrey, Bart., Trafford Park, Manchester  
 Dover, Richard, 27, Baker-street, Portman-square  
 Edwards, Frederick Ezekiel, Wellesley House, Twickenham  
 Fletcher, George, Shipton, Andoverston, Gloucestershire  
 Greatham, William, Stainfield Hall, Wragby, Lincolnshire  
 Hancock, John Donne, Hale, Bishop's Lydeard, Somersetshire  
 Jenkins, Thomas, Plas-y-Ward, Ruthin, Denbighshire  
 Lawrie, Andrew, Mount Mascall, North Cray, Kent  
 Marryot, William, Kibworth-Marcourt, Leicestershire  
 Mello, William, Chadwell Villa, Ware, Herts  
 Murray, Alexander, Eriswell, Mildenhall, Suffolk  
 Parker, Thomas, Tumbidge, Kent  
 Randell, Charles, Chadbury, Evesham, Worcestershire  
 Robinson, Thos. W. Usherwood, Houghton-le-Spring, Durham  
 Roys, Albert Hudson, Brownhill, Rochdale, Lancashire  
 Simpson, John, Pinner Park, Middlesex  
 Squance, Barry Parr, Glaubrydan, Llandilo, Carmarthen  
 Swain, Alfred C., Raddlive, Buckingham  
 Triimmer, Charles, Alton, Hampshire  
 Weston, Jasper, Hofvyl College, River, Dover  
 Wingate, William, Ludford, Market-Rasen, Lincolnshire.

The names of 36 candidates, already received on account of the election at the next monthly meeting, were then read.

FINANCES.—Mr. Raymond Barker presented to the Council the Report of the Finance Committee, from which it appeared that the current cash-balance in the hands of the Society's Bankers, was £3,781. He explained that this balance included £1,500 as the Gloucester subscription towards the expenses of the Country Meeting to be held in that city in the middle of July next. He also laid on the table the quarterly statement of income and expenditure, and of invested capital and liabilities.

JUDGES' REPORTS.—Colonel Challoner, Chairman of the Implement Committee, laid before the Council the following special report:—

"The Committee having taken into consideration the reference made to it by the Council, for the best means of enforcing more punctuality in the presentation of the Reports of the Judges of Implements, are of opinion that

all reports from the said Judges of Implements should be sent into the Secretary (under cover) on or before the 1st of August after the Country Meeting."

The Committee also reported their final recommendations on the general regulations for the exhibition and trial of implements at the ensuing country meeting, which were adopted by the Council.

TURNIP WATER-DRILL.—Mr. Pusey's offer to contribute the sum of £10 as a prize at the Gloucester meeting, for the best water-drill, to drill four rows of turnips with artificial manures on the flat, was, on the motion of Mr. Bramston, M.P., accepted with thanks by the Council.

TULLIAN HUSBANDRY.—On the motion of Sir Robert Price, Bart., M.P., the Rev. Samuel Smith's request for a small extent of trial-ground at Gloucester for the purpose of illustrating to the members of the Society the system of cultivation carried out by him at Lois-Weedon, in Northamptonshire, was granted by the Council, and instructions issued accordingly.

FARM POULTRY.—The Council, on the motion of Mr. Jonas, seconded by Mr. Brandreth Gibbs, voted the sum of £100, as the amount of prizes to be offered at the Gloucester meeting, for improving the breeds of Poultry best adapted for the purposes of the farmer: and referred to the Committee of last year the report with which the Council had been favoured by the Society's Judges of Poultry at the Lewes meeting, with a request that the Committee would offer recommendations on the subject of the particular prizes to be offered in this department.

SHROPSHIRE DOWNS.—The offer of the Hon. Robert Henry Clive, M.P., to place the sum of £50 at the disposal of the Council for Prizes to be offered by the Society at the Gloucester meeting, for "Shropshire and other grey and black-faced Short-woolled Sheep," was, on the motion of Mr. Simpson, seconded by Mr. Jonas Webb, accepted with thanks by the Council. At the suggestion of Mr. Fisher Hobbs, the following classes for this division of Sheep were approved and adopted by the Council:—

For the best Ram of any age . . . . .	£20
For the second-best Ram of any age . . . . .	10
For the best pen of 5 Ewes of any age, with their lambs . . . . .	10
For the best pen of 5 Shearing Ewes . . . . .	10
	£50

FEEDING WITH MILK.—The recommendation of Mr. Milward and Mr. Kinder that in future years greater restriction should be placed on feeding with milk the cattle and sheep intended for the Society's shows of breeding stock, was, at the suggestion of Mr. Fisher Hobbs, referred for consideration to the next monthly meeting. As a breeder, which he still was of

pigs, he might, as those animals were not affected by the regulations in question, take the opportunity of remarking, that however wholesome and necessary restrictions of feeding were to a certain extent, it would be desirable not to carry them so far as to induce unprincipled parties to evade their operation.

**LIVE STOCK.**—The conditions of the prizes for live stock at the Gloucester meeting (with the exception of those for poultry), and the general regulations of the show, were agreed to by the Council.

**CIRENCESTER COLLEGE.**—The Council ordered their thanks for the communications of Mr. Holland, the Chairman of the Committee of Management, and of the Professors at the Royal Agricultural College at Cirencester, for their offer of co-operation in promoting the objects of the Society at its Gloucester meeting, and referred these communications to the General Gloucester Committee of the Society for their consideration.

**COMMITTEES.**—On the motion of Mr. Milward, seconded by Mr. Bennett, it was resolved that in the future recommendations made by the Council to the General Meetings, of members to be re-elected on the Council, their attendance on Committees as well as at the Meetings of Council should be registered, printed, and taken into consideration, before such recommendations were offered.

**SOILS, FLAX, MANGOLD-WURZEL.**—The offer of Professor Wilson to collect specimens of soils for the Society, and to deliver lectures before the members, on the subjects of Flax and Mangold-Wurzel, were received with the thanks of the Council, who referred to the Journal Committee the consideration of the proposed lectures, with a request that they would report their recommendations at the next monthly Council.

**ABSORPTION OF AMMONIA.**—Professor Way, the Consulting Chemist to the Society, reported to the Council the recent discovery which, assisted by Mr. Mainwaring Paine, he had made on that gentleman's property in Surrey, of a natural source of silica, in the state known to chemists as "soluble silica." This deposit was situated in the lower beds of the chalk formation, immediately above the upper green sand, in quantities that would prove inexhaustible; and it was found in many instances to contain no less than 75 per cent. of the soluble silica in question. This substance, so unexpectedly found ready-made to hand in nature, would be invaluable in a variety of ways in the manufacture of manure; and he desired an early day for a lecture, if it met with the concurrence of the Council, in order that this discovery might in the first instance, and at once, be laid before the Society, as a link in that chain of investigations which had been originated and carried on under its own direction and at its own charge, in order that by such early announcement its advantages might be secured, free from monopoly, to its members and the agricultural community. The Council thanked Professor Way for this important communication, and decided that his lecture on this subject should be delivered to the members of the Society in the Council

Room on the second Wednesday in March, at 12 o'clock at noon.

**DEPOSITS OF GUANO.**—Mr. Caird's letter, on the desirableness of giving further encouragement to the discovery of natural deposits of guano, was referred to the Guano Committee.

The Council then adjourned over Ash-Wednesday to the 16th of February.

A WEEKLY COUNCIL was held at the Society's House in Hanover Square, on Wednesday, the 16th of February; present, Mr. Raymond Barker, V.P., in the chair; Mr. Barnett, Dr. Culvert, Mr. Evelyn Denison, M.P., Mr. Dyer, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. William Jones, Mr. Majendie, Mr. H. Manning, Mr. Mainwaring Paine, Mr. Pocock, Mr. Rowlandson, Professor Sewell, Mr. Shearer, Mr. Reynolds Solly, Mr. Crompton Stansfield, M.P., and Mr. Wright. Professor Eugène Risler, of the agricultural establishment at Versailles, having been engaged for some time in an extensive tour of inquiry connected with the progress of Agricultural Chemistry in the most celebrated chemical schools of Germany, and being now on a visit to this country for the purpose of continuing his inquiries, favoured the Council with his attendance at this meeting.

The names of 18 additional candidates for election at the next Monthly Council were received and read.

**DEODORISING SEWERAGE MATTER.**—A letter was read from the Imperial Russian Agency Office, in Pall Mall East, inviting the Council "to witness some experiments on a large scale with the sewerage of London, for the purpose of collecting the solid matter and converting it into guano." The Council ordered their thanks for this communication, with an intimation that some of their members had expressed their intention of availing themselves of the invitation thus transmitted to them.

Mr. Arther Albright, of Birmingham, as one of the members of a sub-committee connected with an experimental Reformatory Institution for juvenile delinquents, solicited information on the subject of the best arrangements to be made for converting the drainage matter of the establishment into an inodorous and valuable manure. The Council decided, that, as many inquiries were made by members of the Society for similar information, Professor Way, its consulting-chemist, should be desired to favour the Council with his views on the subject, at a future meeting.

**EXPERIMENTS IN POTATO CULTIVATION.**—Dr. John Malfatti, of Kueniglberg, near Hietzing, in Austria, transmitted to the Council the following communication, dated the 20th of November last.

The potato-disease, to the despair of the husbandman, is still a difficult problem for natural philosophers and agriculturists; all their views and attempts having hitherto, alas! proved fruitless and unavailing. When I reflected on this disease, I was struck with an idea at variance with all former views, and instead of seeking the disease in external causes

only, I thought that I could discover it only in some internal principle of the plant itself. As early as the year 1848 I made some experiments at my country seat, which proved so satisfactory, though conducted only on a small scale, that I was strengthened in my opinion. But the unhappy revolution which took place interrupted me in the execution of my designs. However, as the disease in question had become worse every year since that time, and as it last year, more especially, attained a high degree of malignity, I determined to renew my former experiments this year on a larger scale. These experiments have proved so successful that I think I have discovered not only the probable cause of this disease and its propagation, but also the way to remove it. According to our views, the cause of this disease, though accounted problematical, lies in the decay and degeneracy of this plant in respect to its double sex, the twofold stock from whence it springs. During the growth of the potato a remarkable and instructive observation offers itself to us at once between the two most distinct acts of the double sex of the plant. The first of these acts is that of its internal principle of self-propagation, and predominates particularly during the period of its development. The second act, on the contrary, is a consequence of the first, and consists in an external reproduction, and conduces to the preservation of the original stock. Whilst now the first act always takes place regularly, and indeed under adverse circumstances, knows no disease, we perceive the disease in the second act, on the contrary, suddenly break out, as if the double sex of the plant rapidly became weakness itself, and, instead of being followed by reproduction, were followed by degeneracy and destruction. It has long been hoped that the disease in question would turn out an accidental and temporary one. But alas! the contrary has proved to be the case, and there is no doubt but its propagation solely proceeds from a sexual cause, whereby it assumes the distinct character of a disease of race. Though we have come to this melancholy conclusion—a conclusion as painful in respect to the present as it is menacing for the future—Nature, that beneficent mother, comes to our relief with a sovereign remedy—a remedy which she has raised indeed to the rank of a law—namely, that remedy which she has provided both as a cure and a preservative, by means of the sexual crossing of races, and that indeed as well in the vegetable as in the entire animal kingdom. This provision of nature is manifestly so excellent, that human art has endeavoured to employ it in both kingdoms, and has done so with the greatest advantage. Taking this point for granted, I endeavoured, as inoculation was a thing out of the question, to remove this disease by crossing the potato with other plants, and, indeed, as it were, by means of a sort of matrimony. The three first potatoes on which I tried this experiment I paired and enclosed severally with the *Helianthus tuberosus*, the *Dahlia variabilis*, and the *Cyclamen europeum*. For a fourth matrimonial alliance I was indebted to chance, and although this was with the *Carduus hispanica*, which does not belong to the genus of bulbous plants, it was attended, notwithstanding, with the most interesting results. The means thus employed terminated in results which, in a most surprising manner, confirmed the truth of the principle which we first laid down. The longing of the potato for union with some plant of a kindred sort, manifested itself in the most distinct manner. Truly we cannot be surprised, if we consider, that since the time this American plant was brought to Europe it has existed in a perfectly isolated state, without enjoying any mutual relation with

kindred plants found in our part of the vegetable kingdom; whilst, on the other hand, the art of Europeans has in all kinds of climates increased the production of the potato to an interminable extent, carrying it even to such an extent as to exhaust its double sex. The product of this matrimonial connexion was most surprising. From the pairing of two plants a third proceeded, retaining, however, a twofold character, the character of each. Their roots, bulbs, and stalks, had grown together, so as to be interwoven one with another in such a manner that it was difficult to separate them one from another when taken out of the ground. The last potato harvest presented the most interesting results, as will appear from what follows. Whilst in my neighbours' fields the disease prevailed as before, and I myself lost a good third part of the potatoes which I had planted on the borders of the field in which my experiments were made, to my great surprise I found not among them a single trace of the disease, although the whole quantity amounted to seven bushels (Metzen). Together with the advantage of restored health, we obtained at the same time another benefit equally important, viz., that of a considerable improvement in the race of potatoes. Not only was this new breed distinguished for beauty, size, and richness; but the general insipidity and mealy taste of potatoes has been, by the communication of the aromatic flavour and peculiar taste of the plants with which they were combined, changed into something of a very different kind and of a superior quality. This was most obviously the case with the potatoes combined with the *Carduus* (they tasted like artichokes). In those combined with the *Cyclamen*, there was a pungent taste, as if they had been slightly peppered; in those combined with the *dahlia*, there was a sweet taste like sugar; whilst the *helianthus* imparted to the potatoes combined with it its own agreeable and peculiar flavour. In respect to the management requisite in forming the four above-named species of combination, we remark as follows:—

1. The Potatoes are, as usual, cut into several parts before they are planted (according to the position of the so-called eyes), and are placed in the earth quite close to the germs of the plants with which they are to be combined. The bulbs of the *Helianthus* and the *Dahlia* are cut just in the same way as those of the Potato. The bulbs of the *Cyclamen* alone remain uncut. As the *Carduus* has nothing but a root, the cut pieces of the Potato are only planted under its root.

2. In the two harvests we perceived that the bulbs of the *Helianthus* were to those of the Potato, in respect to number, as 3 to 2, whilst those of the *Dahlia* and Potato were equal. Here we must observe that these two plants, combined with the Potato, continued growing without interruption, as usual, up to the time of blossoming, whilst the contrary was the case with the *Cyclamen* and the *Carduus*.

3. But the combination with the *Cyclamen* was the most remarkable of all. This wild plant exhibited so little of itself, that for a long time I considered the trial unsuccessful. The same thing happened with the *Carduus* and the *Cyclamen*, some single leaves of which appeared here and there close to the stalk of the Potato, but somewhat sparingly. But so much the greater was my astonishment when, in digging up the Potatoes, I found in that very part the finest and most abundant crop; as if both the said plants sacrificed their growth in favour of that of the Potato, the *Cyclamen* sacrificing still more, even its health as well. We perceived, indeed, that each of the *Cyclamens* had two, three, or even four bulbs diseased to such an extent as to be rotten. As this dis-

ease presented symptoms perfectly similar to those of the Potato disease, we were irresistibly led to inquire whether or not the Cyclamen had attracted to itself the very essence of the disease of the Potato. On this occasion I delayed not to inquire of skilful botanists whether the Cyclamen, which is generally used in feeding cattle and pigs, was subject to this disease, and the answer was a unanimous negative.

4. As I was accustomed every year to plant a great quantity of *Carduus* roots, I was induced to combine them with Potatoes, the result of which surprised me the more, because they do not belong in the least to the bulbous genus. Just for this very reason, a peculiar result followed, the combination being succeeded by a purely parasitical life. The Potatoes clung so firmly to the *Carduus* roots, that they actually grew to them, and, as real leeches suck blood, extracted out of the roots all the juice and flavour. In consequence of this, the Potatoes (like parasitical plants) not only attained the utmost development, both in respect to size and beauty, but what was very remarkable, scarcely had any roots of their own which they struck out. Here, on the hypothesis of the Potato being capable of being crossed even with plants not belonging to the bulbous genus, we may exclaim: What an extensive field is opened for the agriculturist! What singular and what useful experiments may we not make here? and that, too, were we not to reckon those experiments which might be made, and made with still greater certainty, in the extensive circle of bulbous plants.

5. All the entire crop of Potatoes resulting from the four combinations above mentioned I have reserved for sets in future. Should the next planting remain free from every disease, as this year's planting was, I shall consider the problem solved—I shall acknowledge the American plant as a naturalized exotic.

Mr. Rowlandson remarked that he had long considered the Potato disease to arise from a deficiency of potash in the soil or manure in which the tubers were grown. He suggested the trial of sulphate of potash, to remedy this deficiency. This sulphate could be purchased in the market at £16 per ton, in the state known as the "pan sulphate," which contained about 80 per cent. of sulphate of potash, and 20 per cent. of sulphate of soda. This was better than the "granulated sulphate," which was impaired by an excess of common salt. This pan sulphate might be applied in drills, at the rate of 4 cwt. per acre. He had himself tried it with splendid effect. The state of carbonate in which the potash was found in land that had been burned was much inferior to the sulphate of the same alkali. Nor did wood-ashes from Canada and other countries contain more than 14½ per cent. of potash. The carbonate had a powerful effect in causing the rapid development of plants, but had no abiding and sustaining power afterwards; and they died away in consequence. The Brassic tribes also took up much potash. In answer to an inquiry of Mr. Reynolds Solly, Mr. Rowlandson then favoured the Council with a detailed statement of the origin and progress of that expanding concentric growth of fungi, occasioning what were termed "fairy rings."—Mr. Paine remarked that on some fields of his in Surrey (where particular beds of the upper green sand formation,

known to be rich in potash and the phosphates, crop out, his Potatoes grew with remarkable luxuriance in the first stages of their growth, but were subsequently attacked with the Potato disease to a greater extent than those grown on other fields not containing a similar amount of potash.—Prof. Risler corroborated, from his own experience on the Continent, Mr. Rowlandson's views respecting the action of sulphate of potash. He remarked that, in the Vosgen sandstone, the decomposition of which formed in French Lorraine a rather great extent of very light soil poor in potash, a great quantity of wood-ashes was employed as a manure for Potatoes. These ashes were rich in potash, and their market-price high in proportion to the amount of the soluble potash-salts they contained; but poor in the phosphates. The experience of many years on a great extent of land had proved that the Potato disease was diminished by the use of these ashes. The farmers of that district never employed farm-yard manure to their Potato-crops, because that application was invariably found to increase the disease, a result most probably occasioned by the circumstance of the farm-yard manure being richer than wood-ashes in its amount of ammonia and the phosphates. Professor Risler added, that the principal object of Potato-culture in the Vosgen was the production of starch; and the general opinion of the starch-manufacturers was, that the per-centage of starch in the Potato crop was increased by the use of the ashes in question. They found that diseased Potatoes gave in general one-third less starch than sound ones; this proportion, however, varying much, according to circumstances. Professor Risler concluded his remarks by calling the attention of the members to the analyses of Dr. Schleiden, Professor in the University of Jena, and to the opinions on the subject of the Potato disease expressed by him in his work on the Physiology of Plants and Animals and the Theory of Plant-cultivation, forming the third volume of the Agricultural Encyclopedia, published at Brunswick, in 1850. These opinions are contained in the chapter reviewing Dr. Schulze's work entitled, "Thaër or Liebig?"

Mr. W. PATTERSON, of East Cross Causeway, Edinburgh, transmitted to the Council an elaborate paper on the Potato disease, including his own views on the subject, and chronological statements derived from various published sources, intended to elucidate the circumstances of its prevalence and progress.

IMPOVERISHING EFFECTS OF COUCH-GRASS.—Mr. Miles, M.P., of Leigh Court, called the attention of the Council to the great importance of a knowledge of the amount of nutriment abstracted from the soil by weeds, especially by the *Triticum repens*, commonly known by the name of Couch or Twitch. In the last number of the Society's Journal, page 528, Mr. Hemming, the author of the elaborate paper on Agricultural Chemistry, had shown in his classification of tabulated results of analyses, how little was known at the present moment of the composition of weeds, and consequently

how much still remained to be learned of the amount of their injurious effects. With regard to Twitch, in particular, which Mr. Miles was sorry to say was still fearfully prevalent in some parts of the country, he conceived it would be both an interesting and important inquiry to ascertain: "How much a good crop of it must consume the nutriment which should feed the crops of corn—say of Wheat, Barley, or Oats." He quite agreed with Mr. Hemming in his remarks, that the present analyses rather give a general idea of the composition of weeds than are adapted to any purpose of immediate practical use; and that there is a large field open to the researches of chemists to determine what weeds are most injurious to the growing crop, as far as similarity of composition would show it, as also those that are most valuable for manure, from a like reason. Mr. Miles urged the attention of the Council to these investigations; especially to that connected with Twitch, which would, he thought, form an excellent subject for a lecture and discussion, or for a distinct communication to the Journal. The Council received these suggestions with their best acknowledgments, and ordered them to be referred for a report to Professor Way, the consulting chemist of the Society.

**OAK-SOIL.**—Mr. Adderley, M.P., of Hams Hall, Warwickshire, transmitted to the Council a communication on the subject of failure in the growth of the Oak, in a portion of the old Forest of Arden, where the Oaks have retained, from centuries immemorial, their size and vigour. In a fine old Oak avenue in Mr. Adderley's Park, about 200 years old, two vacancies were filled up about 40 years ago, by young Oaks, which had grown well until the last two years, during which they had rapidly died away. Their roots were found rotten, and covered with a fungus like dry-rot; although the neighbouring Oaks were very large and fine, and an Elm filling a neighbouring vacancy in the same avenue was not infected, and its roots, close upon

the rotten ones of the Oaks in question, were quite healthy. Mr. Adderley enclosed a sample of the top soil, 22 inches deep, and stated that the subsoil was red gravel to a considerable depth. The ground was dry, and did not require draining.—The Council thanked Mr. Adderley for this communication, and referred the specimen of soil to Prof. Way.

The Rev. R. J. STATHAM, of Tarporley Rectory, Cheshire, favoured the Council with a report on the success of his industrial training of the cottage boys in his central national school, in the habits and practice of manual husbandry in field and garden work, paying the boys according to the value of their work, and their superintendent about 2s. per day, with a commission upon the crops raised on the school land, subject to a strict Dr. and Cr. account: the earnings of the boys being deposited in the school saving club, as an inducement to saving habits, and bearing a high rate of interest.—Mr. Dalton, of Cardiff, transmitted a sample of Wheat from a crop sown in the last week of April, 1852, and yielding 40 clean bushels per acre on good strong loam after Turnips, from a sowing of two bushels per acre, the original stock having been obtained four years ago from Australia.—Mr. Learoyd, of Huddersfield, stated that he soaked his seed-corn about 16 hours in strong old urine, allowing it to dry before sowing, with great advantage to the early growth and advancement of the plant (as well as to its removal of disease, for which purpose that application with the addition of quick-lime, and other substances, had so long been made to seed-corn.)—Mr. J. M. Pasquier placed at the disposal of the members several samples of prepared seed-corn, with a request that they would test the merits or otherwise of the process adopted, which was intended to supersede or lessen the amount of other manuring matter to the crop.

The Council having ordered their usual acknowledgments for the communications then made to them, adjourned to the 23rd of March.

#### REMARKS ON MR. WHITLEY'S PRIZE ESSAY ON AGRICULTURAL GEOLOGY.

The name of Mr. Whitley must be favourably known to all who read the "Journal of the Royal Agricultural Society," as the author of the Prize Essay on Meteorology, which appeared in its pages a little while ago. At a recent meeting of the Probus Farmers' Club, on the health of that gentleman being proposed, in connexion with the above essay, he alluded to a work which he had formerly published on Agricultural Geology, and to an unfair criticism of it, as he considered, in the *Agricultural Gazette*. As Mr. Whitley appears to labour under a mistake respecting the authorship of the article of which he complains, and as we happen to know the writer, we deem it but an act of justice to our respected cotemporary to disabuse

the mind of Mr. Whitley of this erroneous impression, and of a prejudice which he appears to entertain against the supposed writer.

"You have all read," said Mr. Whitley, "the valuable work in our library—Morton's valuable work on soils. When that work came out, some ten or fifteen years ago, it was considered a very valuable addition to agricultural literature. The theory advanced by that gentleman, that soils were formed by the crumbling down of the rocks on which they are supported, was not only advocated by him, but it was generally received for some time. Mr. Morton was looked on, for a time, as the great gun of the day; assumed a very high position; rode his hobby with flowing reins, whip and spur,

and would give a lash to any one who dared to differ from his peculiar views and opinions. In an unfortunate day," continued Mr. Whitley, "I turned my pen that way, and wrote a little work on *Agricultural Geology*; and my views did not happen, I believe, to accord with the views of the able gentleman who had preceded me. I had a newspaper put into my hand, and was told to read two columns of the *Agricultural Gazette*, and keep my temper. (Laughter). Mr. Morton appears to be the Editor of this paper; and he certainly did lash me, and spur me, and whip me, till the blood got up in my cheeks as I read that article. I do think he did it most unfairly; and he wound up by recommending 'Morton on Soils.' (Laughter). He accused me of having followed and copied a great deal from him on that occasion. But the fact is, that my theory on the Formation of Soils was altogether different from that of Mr. Morton. The theory which I brought forward was, that soils were formed by deposition from water; that some vast torrent of water had swept over the whole country, tearing up the surface, and holding its parts in mechanical suspension; that stones and rubble sank down first, and then the subsoil, of various clayey materials, went down next; and that then the fine earthy matters were deposited over the whole. And if you look at any section of soils, you will be pretty sure that something like this was the way in which soils were formed. I do not mean to say that the above was wholly right, but probably it was a little in advance of Mr. Morton's theory that soils were formed by the gradual crumbling down of the rocks on which they rest.

"Since that we have been favoured with an essay by Mr. Trimmer, who won the prize last year for the best essay on the 'Agricultural Geology of England and Wales.' He not only gives up Mr. Morton as I gave up Mr. Morton, but he goes beyond us both, to this extent, that the geological formation has comparatively little to do with the soil itself. He shows that over nearly the whole of England the soil has been formed by drifted materials that have gone over other formations, and that thus we find soils differently constituted from the rocks on which they rest. With all due respect for the high authority already named, I think he has pushed his hobby a little further than it will legitimately bear; for in our own neighbourhood I find that soils are formed mainly from the rocks beneath, and it is only here and there where we find soils of drifted materials. A few days ago I was at a place in the parish of St. Austell, and found a soil of drifted materials over an extent of four or five acres; but mainly, I may say, that the soils of our county have been formed by deposition from water."

This is Mr. Whitley's case. Now, without pretending to say who is, or is not, the editor of the *Agricultural Gazette*, we beg to assure Mr. Whitley, on the authority of the writer of the article of which he complains, that it was neither written by Mr. Morton, the author of the work on "Soils," nor by any other Mr. Morton. We can even go further, and assure Mr. Whitley, on the part of the actual writer of the critique, which he considers to have been so unfair, that if he will forward to us a copy of his book, ample reparation shall be made for any injustice—if injustice there was—which it received in another place. The question of the extent to which the rock formations influence the character of the soils which rest upon them is a question of great practical importance to agriculture. It is a question to be settled only by careful observation of facts, not by framing theories of the manner in which those soils were formed. We have no doubt that it will eventually be settled, by the observations of Mr. Whitley, Mr. Trimmer, and others who appear to be now taking the matter up in earnest. For ourselves we should say, that while the substrata mark out the general agricultural characteristics of a district much better than the territorial or political divisions of hundreds of parishes and counties, it is impossible to let land by any geological maps yet extant, even the most perfect—an extravagant assertion which we have heard made in favour of such maps. Mr. Whitley is a land surveyor, in considerable practice we believe; and he must know that on every geological formation there are soils (excluding the alluvial soils) of very different values, from the highest to the lowest, and that these variations are unaccompanied by corresponding variations in the mineral composition of the rock immediately below. From what, then, do these variations arise? From a careful perusal of Mr. Trimmer's "Essay on the Agricultural Geology of England and Wales," of his lecture before the Royal Agricultural Society, and his other writings on the same subject, we arrive at the conclusion that he attributes them to the superficial deposits which are unnoticed on geological maps; and that he divides those deposits into two classes—erratic tertiaries and warp-drift. The erratic tertiaries, formerly jumbled up with older tertiary strata and with the warp-drift, under the name of diluvium—a name subsequently changed to northern-drift, and more generally "drifts"—have been proved, by the marine remains which have been discovered in them so abundantly during the last twenty years, to be marine strata of gradual accumulation, formed during the most recent, or pleistocene tertiary, era; but confined to certain latitudes both in the northern and southern hemispheres, and distinguished by certain

marked peculiarities from all other sea-born strata which preceded or succeeded them in those latitudes. The erratic tertiaries are divided by this authority into boulder clay, or lower erratics and upper erratics, consisting of rolled gravel and sand, which approach more nearly the character of ordinary tertiary strata, but still possess some of the peculiarities which distinguish the lower cratics. He shows that in the districts north of the Thames these deposits have an extensive distribution and development, and by their denudation and re-arrangement have produced large tracts of strong or of light land, having a considerable depth of clay, or of sand or gravel, or of both, intervening between the soil and the rocks which constitute the assumed surface of geological maps. With respect to the warp-drift, he contends that it was formed by subsequent aqueous operations spread over the denuded and desiccated surface of the erratic tertiaries, when they are present, and over the surface of other strata when the erratics are absent. The organic remains associated with it, or rather beneath it, are chiefly those of the land, consisting of extinct species of the elephant, rhinoceros, and other large mammals, with land and fresh-water shells, all of existing species, and, with one or two exceptions, of species identical with those still inhabiting the neighbourhood. It indicates some degree of transportation, independent of existing levels and river action, but inferior to that exhibited by the erratic tertiaries. These views, which we find first announced by Mr. Trimmer, in a paper in the *Journal of the Royal Agricultural Society*, on the Geology of Norfolk, before his connexion with the Government Survey, where they met with little favour, appear to be now in the ascendant, having received corroboration from the researches of Mr. Austen, for Devonshire; of Sir R. Murchison, and Mr. Martin, of Pulborough, for the South Downs, the Weald of Kent, and Sussex, and the neighbourhood of Dover; of Mr. Prestwich, for the opposite coast, near Calais. The writer contends that the deposits which these gentlemen describe under different names, and which they also describe as influencing the variations of soil, are identical with those which he had previously described, for Norfolk, Wales, and North Kent, under the name of "warp-drift." The eminent geologists whom we have mentioned differ respecting the agencies to which they ascribe these deposits, no less than respecting the name by which they designate them. Mr. Austen calls them "head," and attributes them to the melting of snow at a time when he supposes the land to have had a much greater elevation than at present. Sir R. Murchison, who calls them "angular flint-

drift," ascribes them to great local inundations over the land, analogous to earthquake-waves; and Mr. Prestwich says that all that can be affirmed at present of the aqueous action by which they were formed is that it was violent, transient, and suddenly arrested. Mr. Trimmer offers no theory respecting their origin, beyond this—that it was aqueous action of some kind or other; neither ordinary atmospheric action nor ordinary marine action, nor those modifications of marine action which distinguish the upper and lower erratics from other marine strata, and from one another.

The existence of these deposits, their peculiar characters, their extensive distribution, their influence in producing soils of different qualities on the same geological formation, and their connexion with the economical drainage of land, are the only points for which he appears to contend. They are, in fact, the only points of interest in the application of geology to agriculture. Questions respecting the agencies by which they were produced belong to theoretical geology, which investigates the ancient history of the earth, and the changes, organic and inorganic, which it has undergone.

It appears, from the passages which have been cited from Mr. Whitley's speech, if we understand them aright, that in Cornwall, which has hitherto been the stronghold of those who maintain the formation of soils by the crumbling under atmospheric action of the rocks immediately below them, and which is a district, moreover, known to be very generally free from far-drifted matter, the soils are formed from the rocks on which they rest, but that they are deposits from water. Mr. Whitley's theory appears, too, to be that a great current swept over the whole country, tearing up the surface and re-arranging the materials. If the "whole country" includes Cornwall, we do not see how this could have happened without producing some intermixture of the materials of more than one formation. If, therefore, Mr. Whitley's observations are to this effect, they amount to a recognition, in that district, of a class of transported deposits distinct from the erratic tertiaries, and indicating a minor degree of transportation. This will be a description, as a local fact, of phenomena which Mr. Trimmer has described as a more general fact, under the name of "warp drift." If Mr. Whitley had previously announced this fact in his work on agricultural geology, it is due to him, on the principle of *sum cuique*, that his priority of discovery of a point overlooked by previous geological observers of the Cornish district should be recognized. Such recognition we shall have pleasure in securing for it, if we find the discovery announced therein.



## T E N A N T - R I G H T .

To be fairly argued, a question can scarcely be too closely confined to the object it seeks, or the effect it contemplates. Digression seldom fails to call up a number of phantom spirits, who too often appear like the puppets in Punch's show—for the sole purpose of being knocked down again. The principle, however, to which they are tacked on, gains little by such extraneous discussion; unless, indeed, it be itself radically unsound; and then, of course, the further we stray the more likely is its innate weakness to remain concealed.

Be it our duty to call back public attention to the real merits of a subject, upon which there has been just now again considerable debate, and no little misrepresentation. That English tenant-right, so long advocated in these columns, has only to fear when its principle is exaggerated, or its purport not understood. May we be pardoned for once more repeating what the object really is?—A fair compensation for unexhausted temporary improvements, to the tenant who has made them, but not had the opportunity for availing himself of their full benefit; such compensation to be estimated and determined by two local valuers, one appointed by each of the persons interested.

And yet in the face of so simple an arrangement what a crowd of objections rise before us! Tenant-right, says one, is necessarily so complicated a business that you can never make it practicable. You can never hope to establish one general system for the common use of the country. Tenant-right, affirms another, manfully avowing himself as an opponent, can conduce to no substantial benefit; for it will not insure that length of tenure without which no farmer can gradually progress to the culminating point of good cultivation. A third fears, though he owns to having for years advocated something of the kind, that it tends too much to fixity of tenure; while a fourth boldly avows that it infringes directly on the rights of property; and a fifth, that it can never be adopted, as it would materially interfere with the exercise of political interest, or, in other words, place the tenant in too independent a condition.

Let us endeavour to notice and answer these objections seriatim. Were a man to announce that he could supply one common lease, the several covenants of which should suit alike every county or district in Great Britain, we should feel that his labour must be unprofitable, and his aim impos-

sible. It would be equally monstrous to assume—although some have done so—that any one system of compensation for unexhausted improvements would work equally well in all parts of the kingdom. Such a notion cannot be but condemned, especially as no one ever yet thought of supporting it. What the friends of the English tenant-right want, is only a due recognition of *the principle*, leaving the detail to be carried out, and the claim settled according to the durable value of the means of improvement in that district in which it has been introduced. So much for the complicated nature of tenant-right; a charge which no man who has at all studied or watched the discussion of the question, we should hope, would ever think again of advancing.

Against the plea that tenant-right does not insure length of time sufficient to develop a proper course of husbandry, we can only repeat what we have very lately had to say on this point. Security of capital and security of tenure mean much the same thing. With the tenant-right principle conceded, a man is encouraged to commence farming with spirit, knowing that if opportunity be not given him to work his own out, he will be allowed in proportion. Further than this, it is a well-known fact that tenants, with only a fair tenant-right custom, continue to hold as long, or longer, than those in the enjoyment of the most liberal leases.

It is amusing to see how directly the next charge contradicts the one just noticed. Tenant-right, complains number three, leads to fixity of tenure. Be it understood we are taking this as an objection to the *English* simple tenant-right of compensation for unexhausted improvement. In no way let it be confounded with any of the Irish rights that go or did go a great deal further. If, then, this English tenant-right puts landlord and tenant on better terms with each other; if it keeps them together in a feeling of mutual satisfaction and confidence, so far, if it please any one to so call it, does it lead to fixity of tenure. But if it be argued that it prevents them from parting should they wish to do so, we distinctly say that tenant-right has a tendency precisely the reverse. If the landlord is displeased with his tenant, there need be no consideration of justice to keep him for years, perhaps, until he has had time to prepare for quitting. Let the notice be issued, the valuers called in, and what is right allowed. On the other hand, if the tenant is uncomfortable, there is no necessity for his long continuing so. He can give *his* notice, and

have his own at the end of it. More than this, a farm left in good condition will always let; and the landlords of England need be in no fear of being bound down to one tenant from the operation of the tenant-right principle. Of course we are assuming that the owners of the soil are in a condition to pay any fair compensation required. If any are not, it is time they tried some other system that might make them so. And tenant-right, let them remember, encourages good farming, and good farming ensures good rents.

“Tenant-right infringes on the rights of property”—because it gives the tenant more than a passing claim on the property of the other. We deny that it does so, or that it ever has or can do so. Agricultural improvements are divided into two classes—permanent and temporary. The former are the duty of the landlord, the latter of the tenant. The word *temporary* itself defines the extent of the tenant's interest, and to the temporary should the right or claim only properly apply. Tenant-farmers are seldom anxious to embark their capital in effecting permanent improvements on the property of another: if they do, however, it is solely from that other's inability; and surely they should only be duly considered, for doing so much more

than ought ever to be expected of them. You can have no good farming without good buildings and good drainage; and if the cultivator of the land so far infringes on the rights of property as to set about them, it is not his fault but his misfortune. He does out of necessity what no one else can do—a greater reason than ever, perhaps, for his being fairly treated. Still, properly speaking, we are ready to admit this is not exactly the province of Tenant-right; although the Legislature, as regards the erection of buildings, has already recognized the principle we maintain.

Some two or three gentlemen have been hardy enough to affirm at different times that tenant-right can never come into common use, because it would interfere so much with political influence; in other words, as we have already explained, that it would place the tenant in too independent a position. Could there be a stronger argument in its favour? Let us be plainly understood here. Our great wish is to see the tenant-farmer in the full enjoyment of this independent position—able to speak and act for himself, and to make the best use of his means, as freely and unshackled as an Englishman ought, and as most other Englishmen can.

## IRISH BEET-ROOT EXPERIMENTS.

Sir Robert Kane, Director of the Museum of Irish Industry, has arrived at the following conclusions as the result of an official inquiry into the composition and the cultivation of the sugar beet in Ireland, and its application to the manufacture of sugar, and has made a report to the Irish government accordingly:—

1. That the sugar beet requires for its successful cultivation a rich, loamy soil, thoroughly and deeply worked, thoroughly drained and divided; and that the presence of organic matter in excess, or undecomposed in the soil, is an important disadvantage.

2. That the employment of saline or rich nitrogenous manures immediately before, or during the growth of the beet, acts unfavourably on the employment of the plant for making sugar, by rendering the juice impure, and increasing the proportion of azotized materials which readily ferment, and thereby convert the crystallizable into uncrystallizable sugar, which is the most usual and important source of loss in the manufacture.

3. That it is fully established that the entire quantity of sugar in the beet exists naturally as crystallizable cane sugar; and that uncrystallized sugar makes its appearance only as a product of decomposition in the manufacture (molasses), and is, therefore, so far, a source of loss, which may be avoided by improved treatment.

4. That the quantity of sugar present in Irish-grown beet is in no way inferior to that usually found in the beet roots used in the sugar manufactories of the continent, and that, in some cases, the per-centage of sugar yielded by beet approaches to that afforded by the sugar cane as usually cultivated.

In considering, therefore, the position of the manufacture as to Ireland, it must, he says, be assumed, that the manufacture should be conducted with the most perfect means, most accurate knowledge, with careful economy, and judicious business management; for, should those conditions not be fulfilled, the manufacture would necessarily fail to succeed there, as it would fail elsewhere from the like causes, and the country or the period would be stigmatized as unsuited or improper for the manufacture, when the fault really lay with the ignorance or inattention of the individuals who had taken up an occupation for which they did not possess the necessary qualifications.

Finally, he observes that the researches which he had conducted fully points out the advantage which may accrue to Ireland from the establishment of the manufacture of sugar from the beet root, and it appears to him as eminently calculated to be of service, not only as creating a new and extensive source of manufacturing employment, but also that, as the materials used can only be profitably obtained by means of improved agriculture, and that an important element in the profits of the manufacture would be the careful economy of the scums and pulp either as manures or as food for cattle, the manufactories of beet-root sugar should exercise a powerful influence on the agriculture of their districts, inducing a greater variety of cultivation, a more thorough preparation of the soil, and a more careful economy of manures; and that in this way, even should the manufacturing speculation become hereafter, by improvement in the management of the colonial sugar industry, or by any other cause less probably successful than it now appears to be, there should still have been conferred on Ireland a great advantage in the improved practice of green husbandry which would be certain to remain.

## LONDON FARMER'S CLUB.

"WHAT COURSE OUGHT FARMERS, INDIVIDUALLY AND COLLECTIVELY, TO PURSUE UNDER THE ALTERED CIRCUMSTANCES IN WHICH THEY ARE PLACED?"

The usual monthly meeting took place on Monday, Feb. 7, at the Club House, Bridge Street, Blackfriars. Subject for discussion, introduced by Mr. CHEETHAM: "What course ought farmers, individually and collectively, to pursue under the altered circumstances in which they are placed?"

The chair was taken by Mr. TRETHERY, who made a few introductory remarks on the importance of the question.

Mr. CHEETHAM said: I can assure you that I have found this subject a very difficult one, and my difficulties are increased by the fact that several gentlemen who have preceded me in opening their discussions have cut the ground completely from under me; Mr. Baker especially, a short time ago, by his remarks on the economy of farming. I confess that when I sent the subject in, I scarcely expected that it would be selected, because it afforded scope for entering further into politics than is perhaps judicious at a farmers' club; but as the committee who made the selection must have foreseen this, I trust that if I trespass a little more on politics than I ought to do, I shall have the indulgence of the Club. It is not my intention to treat the subject more politically than the case requires. It is, I am aware, an undertaking of great responsibility to prescribe a rule of action for the guidance of agriculturists in their present circumstances, inasmuch as at this moment their occupation involves more risk and anxiety than profit; and in complying with the arrangements of the committee, who have selected the subject for this evening's discussion, I cannot altogether exonerate myself from the charge of presumption, more especially when I reflect upon the ability and experience of those I am now addressing, as well as of those members who are absent, and who have both written and spoken so ably upon agricultural topics generally, before whom this address is probably destined to appear. To you and them I do not expect I shall introduce anything new or valuable; I can only state my own convictions plainly, briefly, and fearlessly, and leave them to be corrected by your mature deliberation; and should your judgment be pronounced against me in the resolution which will succeed these efforts, I shall bow cheerfully to your decision, my only aim being the benefit of the public generally, but of agriculture in particular. Coincident with the time that the selection of my subject was announced to me, Mr. Caird's letter to the *Times*, entitled "Agriculture and Free-trade," was placed in my hands; and I am bound to confess, that, amidst much that is chimerical, and something that is suspicious, there are some

useful hints contained in it. I do not, however, intend to occupy your time by a mere critique upon that letter, and shall only notice in this place that portion of it which seems to me suspicious, namely, the more easy transfer of land. When I remember that one of the leading objects of the cotton lords, in originating and supporting the Anti-Corn-law League, was to reduce the money value of land, and render it more easily attainable by persons of their own class, whose immense wealth and boundless ambition prompted them to aspire to usurp the position of our time-honoured landed aristocracy, I conceive the recommendation to make land more easily transferable becomes suspicious, to say the least of it, especially when it proceeds from such a quarter, and is addressed to the recognised organ of the moneyocracy, among whom must be numbered many cotton lords. Moreover, I do not quite see how the tenantry are to be benefited by the more easy transfer of land, although if entailed estates could be rendered responsible for their own improvement, as recommended by Mr. Caird, it would perhaps be exceedingly beneficial. I will now draw your attention to the more immediate business of the evening, and I propose to consider the subject under these two separate heads—namely, its individual and its collective character. As to its individual character, the first thing to be considered is the tenure under which tenant-farmers hold their land. Mr. Caird recommends leases with liberal covenants, but is ominously silent as to the nature of those covenants, and also as to compensation clauses. If one might venture to differ in opinion from him, I should certainly not recommend leases, because of the great uncertainty which enshrouds agricultural prospects. My own belief is, that we have not seen either the highest or the lowest points to which agricultural products may be driven. Most persons recollect the abundance, and consequently low prices of the years 1834, 1835, and 1836; and I am here led to ask what those prices would have been under unrestricted foreign competition; and what has occurred once may, and in all probability will, occur again. Do not fancy that any price at or about 30s. per qr. will prevent foreign competition, for I myself once saw a very fair sample of foreign wheat offered in the interior of the kingdom at 25s. Taking this view of the case, then, are you prepared at all events to accept leases? A hundred things may occur to make a change of occupation necessary, which is not so easily effected if bound by a lease. A yearly tenancy, then, under equitable agreements, embracing compensation clauses. is in my

judgment far preferable, particularly for encouraging *progressive* improvement. Again, to meet the prices of the present day, it will be necessary for the farmer to economize in every branch of his expenditure, to bring it on a par as nearly as possible with his income. But how is this to be accomplished? The *Times* says—"land must be cultivated in masses," and Mr. Caird in some measure seconds the proposition, by recommending the more extensive use of improved machinery; but as it is only the large farmer who can avail himself of that aid, what is to become of the thousands of most useful and industrious men, who occupy from one hundred acres downwards? To these Mr. Caird says, emigrate. And is this the fruit of the so much vaunted system? Are we to deny to the hardiest and most loyal sons of toil this or any other country ever saw the privilege of providing for themselves and families by the application of their energy, skill, and capital, on the land of their birth, in the home of their fathers? And must they be driven to sever their nearest and dearest ties, to seek a living amongst strangers and aliens on a foreign soil, in order that a comparatively few overgrown capitalists may add to their (in many cases) ill gotten wealth? From 1786 to 1792 the average price of wheat was 47s. per qr., and the wages of labour 10d. per day in winter, and 1s. in summer. Why cannot the farmer get his labour at the same rate now? Wheat will not in all probability be higher in the present six years, commencing with 1848, than it was then. Two causes operate powerfully against it—the emigration of our best agricultural labourers, and taxation, the latter of which would starve a man and his family to death now, upon the same wages as kept them in comparative comfort at the time I speak of. Taking a farmer's rent, rates, taxes, and labour into consideration, are his expenses at all commensurate with his income, as compared with the six years from 1786 to 1792? I believe not; and this in my judgment has been, is now, and ever will be, until a radical change takes place, the great impediment to his prosperity; and it will be my endeavour in prosecuting this inquiry, to show in the second chapter, how by combination he may in some measure extricate himself from his difficulties; combination amongst our political opponents, and the want of it in our own ranks has been the chief cause of our disasters. Draining seems now to claim our attention as the foundation of all good husbandry; but I do not propose to go further into the question than to say, that no tenant farmer ought to pay any part of the expense of draining unless he is amply secured from loss by agreement. The landlord should perform all such works as draining, erection and repairs of premises, &c., even though he should charge the tenant with interest upon his expenditure. To him, if judiciously carried out, it would be a safe investment, and the plan would possess the advantage of leaving the tenant's capital at liberty for other purposes. It has been much the fashion of late to propose "high farming" as a panacea for all the evils agriculture is "heir to;" but that high farming

is not at all times profitable, we have a familiar example in the celebrated Tiptree Hall balance-sheet, although an attempt was made by its spirited owner to explain away the deficiency, by carrying a large portion of it to the improvement account—an arrangement which would have been fair to some extent, if the balance-sheet year had been the first wherein a large consumption of artificial food had taken place, as it is self-evident there could then have been no return for the outlay; but I have an indistinct recollection that when Mr. Caird visited the place, and reported on it a few years since, he stated that (I think) 14 quarters of corn were daily consumed by cattle and pigs. If this large outlay continued year after year, without making a suitable return, but had to be carried to the improvement account each successive year, it is very clear that the farm would, in the course of time, become so improved that its value would not be known, appreciated, or realised. I readily admit, however, that Mr. Mechi carried "high farming" to excess; and we must not forget that his deficiency was in excess also. It is my earnest and deeply-rooted conviction that the higher land is cultivated the more liable it is to blights, mildews, and other contingencies of that character. In proof of this I refer you to the lower portions of Lincolnshire and the Isle of Ely, where the land is not only naturally fertile but well farmed; yet I believe no part of England has suffered so much from such visitations as those districts. Allow me also to refer to my own experience. In 1840 I had a field of wheat which produced six quarters per acre; in 1844 the same field was wheat again, and again produced six quarters per acre; in 1848 it was wheat again, after seeds, as both the preceding crops were, and I never saw a more promising crop in my life; but instead of getting six quarters per acre, I gathered just six bushels, which sold at 32s. per quarter, when good wheat was worth from 45s. to 47s. Here, then, was my average reduced, as far as that field was concerned, from six to a trifle over four quarters per acre. If land be farmed on a scale capable of bearing six quarters of wheat per acre, and it produces only four, the loss in those times is severe. An intelligent Hampshire friend of mine says—"He who farms for seven sacks of wheat per acre will accomplish that without much difficulty, but he who farms for ten sacks does so at great risk, because he is then wholly dependent for success upon the seasons, and it becomes a high speculation." What has been urged relative to high-farming applies with equal force to the breeding of cattle and sheep, at least as far as my experience enables me to judge. Unless the greatest care and circumspection be exercised to preserve the proper quantity of flesh and the robustness of their constitutions, the further they are removed from a state of nature the more delicate and susceptible of all manner of diseases they become. Whilst, however, I am no friend to "high farming" in the popular acceptance of the term, believing it to be fallacious and deceptive, I am nevertheless an ardent advocate for *good* farming, embracing deep and clean cultivation, more

especially for root crops. This will never deceive, and may be recommended for general practice with confidence, remembering "Poor Richard's" advice—

"Plough deep whilst others sleep,  
And you shall have corn to sow, to sell, and to keep."

In relation to this subject, I once stated in this room the result of an experiment in deep cultivation as between the "plough and the fork," which was manifestly in favour of the latter. I consider the best and cheapest mode of improving land, where it is dry enough for the purpose, is to give artificial food to sheep at turnips, because I have found sheep generally pay better for expensive food than beasts; and I am surprised when I find people persevering in the practice of fattening beasts in stalls for the sake of the manure only, when they must occasionally sustain great loss thereby—that is, if fattened chiefly or entirely with cake, or other artificial food. If fattened chiefly on roots, I can set very little down to the credit of manure, because at best it is but a "rob Peter to pay Paul" system, and I scarcely know a more exhausting crop than Swede turnips, when taken from the land. As a means of improving the farm, therefore, I do not think the plan worth pursuing. The only method in which I consider the practice of drawing swedes allowable, is to carry away about a moiety, feeding off the remainder with sheep, and giving artificial food liberally to supply the deficiency. Rather than incur great expense in feeding beasts, why not buy guano, or other artificial manures, so easy of transit and so convenient in their application? You would then know at once the extent of your outlay for fertilizers, which in the case of fattening beasts is often difficult to ascertain. As to the application of manure, little need be said. A new era seems dawning upon the minds of agriculturists in this respect, and the old practice of giving a heavy dressing at intervals of four or five years, is fast receding before the common sense practice of manuring more sparingly, and at shorter intervals. Before I close this portion of the subject, I must thank Mr. Caird for drawing attention to the necessity of eradicating old and useless fences; but why not apply the axe to the root of the timber trees also, which in some districts are thickly studded, and overhang the fields to a ruinous extent? I admit that timber adds much to the charm of country scenery, but I expect the time is fast approaching when it will become a question, whether the beauty of a country, or the value of its products will be considered of the most importance. It now remains for me to grapple with the second portion of the subject, of which malt and hop duties repeal, an equalization of our local burdens, and a considerable relaxation in our currency laws, will form the leading features. First, in relation to the malt and hop duties. Their operation is too well known here to require illustration. I will, however, observe that taxation to be just must press equally, and that these burdens do not press equally must be apparent to all; for whilst the people in the cider districts are, as consumers, comparatively exempt from their operation, the people in by far

the greater portion of England are exposed to the full weight of those imposts. But I believe the hop growers, as producers and consumers, are feeling the oppression more intensely than any other class, because it is clear that hops, whatever their price, cannot be forced into consumption without malt, to which the obnoxious malt tax is the bar. But are those exorbitant duties upon home production a legitimate source of revenue? Ought revenue to be derived from the wealth or the wants of the people? Is it just to wring from the working classes, who are the principal consumers in the shape of malt and hop duties, a sum equal in amount to the income tax paid by all the trade, commerce, and property of this kingdom? To these questions there can but be one reply. Let us then combine with energy, perseverance, and determination to expunge from the statute book this abomination. And this naturally leads me to ask, where can a consistent opposition to such an act of justice originate? because it is a step in the direction of free trade, at present the people's idol. Let us not be led astray from our object, by those who assert that if the malt duty be repealed, malt will be imported largely; for various cogent reasons, which I need not state here, I most emphatically urge upon you not to believe it. But even if malt were largely imported, it would surely hold out no terrors to the consumer, and the producer would most certainly have no occasion to fear it, because if it came in as malt it would not come in as barley, and in the former case we should only lose the labour upon the manufacture. I conceive that the importation of wheat and wheat flour, and barley and malt, are parallel cases; and further, I find that in 1850 we imported more than a million quarters of barley. If, then, the importation of that article increased with the repeal of the duty, is it not fair to conclude that we could not import so much wheat, which would be an advantage to the wheat grower? With regard to local burdens, especially the poor rates, Mr. Caird has recommended an alteration in the law of settlement—a measure fraught with some benefit undoubtedly, but altogether inadequate to the requirements of the case. I wish to know why all realised property of every description should not contribute its fair share to the maintenance of the destitute poor at least; and why this should not be made a government charge, and why this should not be administered by local boards as at present constituted? This, and more than this, may be accomplished by persevering combination, and without it nothing can be effected. But to succeed, we must be careful to direct our energies to one subject at a time, and when that is properly disposed of to attack another. It must be admitted that nearly all our legislation of late years has been directed to the extension of trade and commerce—a very praiseworthy object, if accompanied by other suitable measures; but as an intelligent friend of mine says, "they have opened the ports and shut the banks." In other words, when our extended commerce absolutely demanded an expanded currency, acts of parliament followed each other in succession, all tending to

bring our circulating medium within the most circumscribed limits. It is stated by no less an authority than Sir Archibald Alison, that in 1814, when our population was only 18,000,000, we had a currency of 68,000,000*l.*, or about 3*l.* 18*s.* 6*d.* per head. Now (1847) we have only in the whole empire—gold, silver, and notes issuable upon securities, taken together—a circulation of 72,000,000*l.* for 28,000,000 persons, or about 2*l.* 10*s.* 6*d.* per head. In speaking of the immense loss of property consequent upon the panic of 1847, the same authority says—"The Three per Cents. in August, 1815, stood at 104; in May, 1847, they were at 86, and all other public funds had sunk in the same proportion. There was a loss of nearly 20 per cent., or one-fifth, on the public securities, which, on £785,000,000, their present amount, is £160,000,000. Taking into view the simultaneous and still greater decline in the value of railway, bank, and other stock, great part of which had fallen 20 and 30 per cent., it may safely be affirmed, that the destruction of property experienced within the last eighteen months has been two hundred and fifty millions sterling. This is ten times greater than the loss which would have ensued if all the bank-notes in the kingdom had become worthless; and the whole of this loss is to be set down to the monetary laws; no part of it, or at least a most inconsiderable part of it, is to be considered as arising from the visitation of Providence, or causes over which we have no control." That the recent gold discoveries have prevented the price of produce of all kinds from falling lower, and have, at the same time, tended to raise wages, is beyond all question; but how far that circumstance will prevent a recurrence of the disasters of 1847, is a problem I must leave to wiser heads than mine to solve. This is a question affecting trade and commerce as well as agriculture, and, to insure success, ought to be taken up by all parties with unanimity; and I see no reason why all opposition should not give way to combined efforts. Before concluding, I am anxious to say a few words on the important subject of agricultural statistics. Mr. Caird has alluded to this question; and although I do not profess to see much relief to tenant farmers in it, yet I am ready to admit that to society generally, and the government in particular, agricultural statistics would be an immense advantage, if properly and correctly taken; and it occurs to me that by re-establishing the Board of Agriculture (this and the local clubs throughout England co-operating with it) a scheme might be perfected, at a comparatively small cost, for taking statistics more certainly and correctly than by any plan that has yet been devised for that purpose. A Board of Agriculture would, in short, be to farming what the Board of Trade is to commerce; and I see no reason why the still important interests of agriculture should be committed to the care of such men as the disciples of Cobden, Bright, and Co., whom we have lately seen presiding at the Board of Trade. Mr. Cheetham then concluded his address amidst loud applause.

Mr. BAKER, of Writtle, said he had but little to say on this question, having lately occupied so much time on a similar one; but there were a few points to which he would advert. First, as to the impetus which was said to have been given to agriculture. With great deference to Mr. Caird, he must say he did not think it arose from the sources to which that gentleman ascribed it. Mr. Caird had alluded, in his celebrated letter, to a great number of improvements which had been made in agriculture. He (Mr. Baker) believed there was not one subject touched upon by Mr. Caird which had not been fully discussed in that Club, while most of the resolutions which they had arrived at he had taken up (Hear, hear). He did not accuse Mr. Caird of copying from them what he put forth as his own; he only mentioned the fact to show that as a body they had entertained the questions introduced in the letter. As regarded high farming, he thought Mr. Caird had not fairly stated the farmer's position. Considering the nature of the farm which he occupied, the access which he had to large quantities of manure suitable to the soil, and the adaptation of the land for the growth of potatoes when the crop failed in other parts of the country—taking all this into account, he did not consider the case put before them a proper test of high farming generally; and he thought there were few farmers who did not understand that. No doubt there had been a great impetus given to farming of late years; but he thought it was chiefly owing to the alteration in the poor-law and the alteration in the Tithe Commutation Act. The alteration in the poor-law had the effect of throwing men upon their own resources. At the time when he entered the parish in which he resided, with corn at its present price, there were generally from 60 to 80 men out of employment during the winter season; and if the evil had not been cured, the whole free simple value of the land must have been swallowed up. A remedy, however, was applied; and from the passing of the new law down to the present time there had scarcely been one unemployed labourer in his parish, except during very severe weather. The Tithe Commutation Act also had been very beneficial. Under the old system tithes were taken in kind, and consequently but little money was invested in land. No farmer could wish to invest so long as he had reason to apprehend that his investment would be taken advantage of by the tithe impropiator. The alteration in the law had given confidence to those who were employed in agriculture; and although the Tithe Commutation Act had not produced so speedy a result as they had expected in reference to price, he trusted that in a year or two its operation would be most beneficial to the farmer. Mr. Cheetham had expressed an opinion upon which he was at variance with him as to the mode of occupying land. It was, that a yearly tenancy with compensation clauses was preferable to a lease. Now he (Mr. Baker) considered that no occupation could be so beneficial as a lease, if it were based on a good sound principle (Hear, hear). From about the commencement of the French Revolution, many tenants having long beneficial leases

held them very injuriously to the interest of the landlord. From about the year 1812 to 1830 the case was just the reverse. Tenants having taken leases which they were unable to continue, threw them up; and this also operated very injuriously to the landlord. In the first period the landlord did not receive what his land was really worth; in the second, tenants did not pay in consequence of the alteration which had taken place in the value of grain. Now a landlord who held an estate at those periods would naturally ask himself how far he was benefited by granting leases, and would probably refuse to grant leases, except on a different principle. A different principle had in fact been carried out. In Scotland the amount of rent was based on the value of the produce, and the result of this was, that whatever decline there might be in price, the tenant was not injured. It must be evident to every one that if a person wished to hire a farm, the rent would be based on the supposed value of the produce during the period over which the hiring would extend; and if compensation clauses could be introduced into leases whereby the amount of rent would be determined by the number of quarters of corn, no difficulty could arise in farming. Whatever was due to the landlord the tenant would pay, and no more. Much had been said as to the draining of land. The draining of land evidently increased its value, and if a gentleman who had an estate worth £4,000 a year, by draining enabled it to produce one-fifth more, he clearly raised its value from £4,000 to £5,000 a year. It had been shown that to maintain a system of drainage required only five or six shillings per acre, and, therefore, no one could doubt the practicability of such operations. His opinion was, that the investment should be made by the landlord; and that where that was not the case, the tenant in making the outlay should be secured by a lease or an agreement. As regarded mildew he quite agreed with Mr. Cheetham, that it effected highly-farmed more than moderately-farmed land (Hear, hear). But he did not admit that mildew was produced by high farming alone. No mode of farming hitherto known would prevent it. Whenever there were sudden alternations from heat to cold, or from cold to heat, there would be mildew. During the last year the weather had been particularly unfavourable. The malt-tax had always been a moot question with them, and he was now going to say what differed in some degree from his own former opinions and the opinions of those around him. He thought the altered circumstances of the country peculiarly affected the farmer's position in relation to that tax. The exportation of beer from this country had become very great indeed, and was continually increasing; and so long as the supply of gold from Australia continued, so long would the demand for beer continue. It should be recollected, too, that at the present time the produce for making beer was raised from a certain area of land which they could not increase, and that only a particular description of land could supply malt of a quality which was fitted to make beer fit for exportation. Barley was now one

of the dearest articles in this country. Why? Because the demand for it was greater than the demand for other articles, and that demand could not be fully supplied without the aid of barley from abroad. The barley imported into this country from abroad could only be drawn from certain districts; the barley of the last year's growth would not make its appearance until May or June, on account of the closing of the Baltic; and the consequence would be that, under the repeal of the malt-tax, foreign barley would reach this country in the shape of malt, and there would be such an accession of foreign malt as would in a great degree countervail the high prices which they were now getting for their barley. The result would be, he thought, that the best kinds of barley would fall in price, while the poorer descriptions rose. Those were his opinions with regard to the abolition of the malt-tax.

Mr. CROWLER said he was under an impression, from information which he had received, that the extremely cold winters of the Baltic shores altogether unfitted them for the manufacture of malt fit for the English market. Every one who was at all conversant with the matter knew that even in our own climate the mildest weather was the best. Even suppose foreign barley to come in the shape of malt, they would only lose the labour of it. With regard to the benefit derivable by the producers of grain, he thought the benefit would be much less on the best barley-farms than on cold-land districts. On the present plan of cultivating cold strong lands parties might certainly secure large crops of corn by using artificial manures; but before resorting to such aid, men were bound to consider whether the prices were likely to repay them. He was aware, too, that malted oats were almost as useful for cattle as malted barley, and these would enable the farmer to feed his animals during the winter without resorting to artificial manures. As farmers generally, however, were now exposed to the unrestricted competition of the whole world in the production both of corn and of meal, it was but fair that there should be no restriction on their operations. The abolition of the malt-tax would in many cases obviate the necessity for consuming cake; and, if the same object could be obtained, he thought that farmers generally would be much better without the employment of guano. The feeding of sheep was, in his opinion, the very life and soul of good farming. All who keep sheep should ascertain the state of their land, and how many sheep were necessary to keep the land in good condition. He had found by experience that not more than a given quantity of sheep should go over a particular space within a given time. There might be differences arising from locality, but in his own case he found that 100 sheep should not go over more than half an acre of land in a week.

Mr. BODDINGTON said: With respect to the transfer of land, he should certainly prefer a cheap and easy method to an expensive and tedious one. The only benefit of the former was, that it put money into the pockets of the lawyers. Many farmers occasionally

wanted to buy a small quantity of land, and they had to pay for the mere transfer an amount very disproportionate to the sum charged for transferring a large estate. With respect to wages, he thought the present wages of farm labourers bore no proportion to the accumulated capital of the country; but that he attributed to low prices. As to cultivation, both very high and very low farming were attended with evils: the medium was probably the best. They all knew that if they lived either too high or too low they suffered in consequence; and so it was, he believed, with respect to farming. With regard to mildew, he thought it might be prevented by the use of sulphate of copper. At one time he had much trouble with the disease in barley, but the use of half a pound of sulphate of copper to four bushels of barley had entirely eradicated the evil.

A MEMBER asked whether the speaker meant mildew or smut?

Mr. BODDINGTON, after a little consideration, confessed that the disease of which he should have spoken was smut. As to the felling of timber, he thought it might be carried to an injurious extent. In Lincolnshire, where there was no timber, and where the hedges were low, one-seventh or one-eighth of the sheep were lost in winter; and he was disposed to think that the loss arose from exposure to cold. In Warwickshire such losses were hardly ever heard of, because there were high hedge-rows and trees to preserve the sheep. He was an advocate for the repeal of the malt-tax, because it was a partial tax, and because it was inconsistent with the principles of free-trade. He had heard of a member of parliament standing up in the House of Commons, and saying that he would not advocate the repeal of the tax because labourers could work better upon water than upon beer. He would like to get that member into a field, and put a scythe into his hand, and compel him to mow for three or four hours together without having any malt liquor (Hear, hear). The Herculean tasks performed by labourers at harvest-time were owing in a great degree to the use of beer (Hear, hear). It had been said that foreigners could not grow barley. Why they had supplied the best barley to be used this year at Burten. The Burten brewers had bought their best barley at Hamburg to make pale ale, and had paid 6s. or 7s. extra per qr. for it. He knew the man who was employed to make the purchase.

Mr. PAYNE asked what was the price paid for it.

Mr. BODDINGTON replied that it was bought at 40s. a quarter, and cost the brewers at Burten 44s.

Mr. FISHER HOBBS had come there that evening rather for the purpose of hearing the opinions of others on the question upon the card than to express his own. But he could not allow many of the remarks of some of the gentlemen who had spoken to pass altogether unnoticed. A great society, which had fought ably and well in the cause of the tenant farmers, had that day been dissolved; and he must say that he regretted to find that gentlemen coming from the South Sea House to that club were not unanimous in laying down some

course for the tenant-farmers to pursue, either so far as future legislation was concerned, or for their own individual efforts. (Hear.) He was much pleased at the manner in which Mr. Cheetham had introduced the subject, because he had gone boldly into many points which were connected with agriculture, though he differed from him with regard to the transfer of land. He had hoped, now that "Protection" was gone, and they had all met there on a friendly footing, that they would have heard no more vituperation of their opponents, but have pulled together; and though they had heretofore shown their weakness by disunion, have come united on that occasion, and chalked out a line of action that would have been just and equitable, and commanded the sympathy and assistance of all classes. (Hear.) Nothing grieved him more than to hear that his friend, Mr. Baker, with whom he had long co-operated on the question of the malt tax, had turned round and deserted them upon that subject. Owing, perhaps, to the extra price which our best barleys were realizing in the market, Mr. Baker had been induced to think that we grew a superior quality to that which was produced on the Continent. But he (Mr. Hobbs) was convinced that this was a mistake, for there were times when he had known foreign barley bring higher prices than domestic in the English market. For his part, he was inclined to attribute the advance on barley to the wet weather of last harvest, and the consequent fact that out of fifteen million quarters of barley grown in this country there were scarcely five millions of quality sufficiently good to warrant the payment of so heavy a duty. Now, until he saw that full justice was allowed the home producer, he would, through good and through evil report, advocate the repeal of the malt tax; for he was convinced it was a measure that would prove most beneficial to them as farmers in the feeding of stock, and that it would also have the effect of breaking up the brewers' monopoly, altering the licensing system, and enabling the industrious labourer to obtain a cheap, wholesome, and necessary beverage. (Hear.) The subject which had been brought under consideration to night was a most important one. It behoved them to see how far they could supply food to the population of this country at the cheapest with a profit to themselves; and to this end, as practical men, they must consider well the extent to which they could adopt the improvements suggested by the Royal Agricultural Society, or which came from any other quarter; for even if Mr. Cobden himself recommended that which was advantageous to agriculture, he (Mr. Hobbs) could have no objection to receive it from him (cheers). To the employment of machinery especially they must now direct their attention, seeing how great at the present moment was the emigration of their labourers to the colonies. Much might be done by the proper application of machinery, though not by running after every new-fangled invention, but rather by the improvement of existing methods. Another subject of importance was the proper application of manures: and here he could not refrain from saying that he



believed it was chiefly on account of their being disunited that the monopoly in the article of guano had been kept up for so long a period, and that they had to pay £3 a ton more than they ought to pay for it. He was strongly of opinion, however, that substitutes for guano were to be found; and if the Peruvian government, the Peruvian bondholders, and Messrs. Gibbs and Co. did not listen to their remonstrances, they must not cease in their endeavours until they had discovered what these substitutes were (Hear). By a judicious management of their labourers—by attending, indeed, to the “economy” of labour—they might also benefit themselves. And if they would carry out a system of piece-work, instead of day work—in this following the example of the manufacturers—he was satisfied they might save from a penny to twopence in every shilling expended in labour. So much then with regard to “individual effort.” As to “collective” effort, all he would say was, that one class having openly confiscated their property, and another having deceived them, they must now depend upon themselves. There were many ways in which by acting together they might greatly benefit themselves. One was by the breaking up of the monopoly created by the malt duty; another by an adjustment of burdens; and if in attempting the latter they could not make out a case, he for one would at once give in; but it struck him that it was only two or three years ago that Mr. Disraeli did make out a case that farmers were unjustly and unequally taxed. If he had £10,000 embarked in agriculture, and a similar amount in trade, where was the justice of calling upon him to pay more in taxation for the one £10,000 than for the other? Until such a system as that was remedied, he trusted the farmers would never cease their application to the legislature. At the present moment, he regretted to say, they had not the support of many of those whom they sent to parliament—for he had frequently seen that honourable members who had advocated a repeal of the malt tax when their opponents were in power, became either lukewarm in its support, or directly opposed to it, as soon as parties changed sides and their friends assumed office (Hear). That he feared, however, was very much the fault of the constituencies themselves, who had not generally impressed upon their members the necessity for representing them more fairly. In future, therefore, let them exert themselves in this direction, and show that they were determined on the repeal of those laws which pressed so heavily and unjustly upon them (applause).

The Rev. Mr. DAY said he trusted that although a certain association to which many of them had been attached was now defunct, farmers would not cease to confer together; and he especially hoped that they would combine in the great Metropolitan Farmers' Club, and that similar institutions would spring up throughout the length and breadth of the land. It had been frequently said that the late Sir Robert Peel was a traitor. The truth was that the landlords were traitors; had they never joined hands with Sir Robert Peel he could not

have carried his measures. Tenant farmers must in future take the initiative in everything, and must prepare for the struggle. He would be glad to see the same principle extended to labourers. One of the speakers had referred to water. Was he aware that the Romans, in their best days, were water-drinkers? and that their degeneracy dated from the time when they began to drink wine? (laughter.)

Mr. PAYNE said there were one or two things in Mr. Cheetham's lecture in which he did not concur. One of the opinions which he expressed was that leases were not beneficial. Now he (Mr. Payne) had travelled a good deal in this country and in other countries, and wherever he had seen good farming—whether in Ireland, in Scotland, or in England—he had generally found, on inquiry, that attached to it there was a lease (Hear). It was all very well to talk about mutual agreements; he would like to know where they were acted upon with the same degree of confidence as was derived from a lease. He had always advocated leases, on the ground that the tenant should be able to lay out every shilling with confidence. He might be dealing with one of the best of men, and feel confident that under such a landlord he would not be turned out; but if a change came, his capital was disposed of for the benefit of the owner of the soil. One word with respect to high cultivation. The great art and mystery of farming was to get just as much wheat as they wanted, and no more. But there were two or three modes of doing this. He believed that nothing could be more fallacious than to manure for wheat: it was altogether a mistake. He had not seen any high farming which, in his opinion, was likely to produce mildew in corn, provided the corn were put in its proper channel. The subject of drainage had been touched upon. What could contribute more to the extension of drainage than the general adoption of the system of leases? (Hear, hear.) There were a great many landlords as well as tenants who were not overburdened with money; and in many cases the tenant would be willing to drain himself, if the landlord would give him a lease. As regarded drainage, therefore, he thought leases would be highly beneficial.

Mr. SIDNEY was glad that he did not rise before the delivery of the thoroughly practical speech which they had just heard, for he thought the general tone of the discussion was scarcely worthy the club. The time was come when farmers, if they wished to advance their interests, must cease to isolate themselves, and combine with other classes in seeking a reduction of taxation (Hear, hear). He was glad to learn from that valuable newspaper, the *Mark Lane Express*, to which that club was so much indebted, that the various associations in the country were now turning their attention to practical matters. This was the case in Lincolnshire, Cheshire, Gloucestershire, Wiltshire, Kent, Cambridgeshire, and other parts of the country; and in the last-mentioned county a farmer very properly observed that under the altered circumstances of the country those who paid the county rates should have some share in their admi-

nistration (Hear, hear). The transfer of land had been treated that evening as a thing which farmers had nothing to do with. He was of a contrary opinion, and thought that if land were made as easily transferable and as easily chargeable as other kinds of property, the result would be a general improvement in the condition of estates. Landlords as a class were perhaps as improving as any other section of the community; but they did not like publicity, and no alteration would be made unless there were pressure from without. As regarded the union rates and close parishes, he would observe that the principle of a national charge could never be carried out; for, if they once allowed local parties to put their hands in the national purse, all property would soon be swallowed up. The best alteration would be to extend the area of the unions. In claiming the abolition of the malt-tax, farmers no doubt claimed only what was fair and right. There were some, however, who seemed disposed to make a budget in spite; forgetting that they could not pinch one part of the nation without at the same time pinching the rest. The question was, after all, how the necessary amount of taxation could be raised with the least injury to the country; and as there was not at present a sufficient surplus to take off the £5,000,000 produced by the malt-tax, and as it was admitted that a partial reduction would be of little use, he thought it was best not to make any alteration. If they would direct their attention to the probate and legacy duty, and get it applied to landed property, they would thus secure £6,000,000, which would provide for the repeal of the malt-tax, and leave £1,000,000 for other purposes. It was by such means that they should seek to alleviate their present condition, remembering that all Englishmen had the same interest in an equitable system of taxation. (Cheers).

Mr. ACORN said, Mr. Hobbs appeared to intimate that tenant-farmers should hold themselves independent of the Legislature; but he could not forget that they were indebted to Parliament for numerous enclosure acts, the enfranchisement of copyholds, and other measures of a similar character. He hoped that in seeking their own benefit they would not forget the labourer. It appeared that the Wiltshire labourers were now demanding an increase of wages from 7s. to 9s. a week. He really thought that with present prices something should be done for the labourers; and he had no doubt that, under proper treatment, they would become better members of society.

Mr. ROWLANDSON wished to refer to some experiments made by himself and others in reference to smut. In Lincolnshire arsenious acid, or arsenic, was found an almost and infallible remedy; but it was a very dangerous remedy, and parties had been known to die from eating partridges killed in the neighbourhood. The use of year-old wheat had also been found a preventive. Something had been said that evening with respect to the preservation of manures on the farm. He thought that if better conveniences were to be erected, it should be done by the landlord, as the tenant's capital was all needed for cultivation. While on that subject, he begged to repeat an anecdote. An amateur farmer lately went over a Scotch farm for instruction. He was conducted round by a shrewd old bailiff, and was very much pleased with all that he saw. After completing his survey, he asked the bailiff what he considered to be the first principle in good farming? The reply was, "Well, I think muck is the first." "Ah!" said the amateur, "I suppose everybody admits that; but what should you say is the second principle?" "Well," said the bailiff, "I think I would have muck again." "What do you say is the third principle?" said the inquirer. "Well," said the bailiff, after scratching his head, "I think I should have mair

muck." (Laughter). There was no subject on which there was greater apathy among agriculturists than on this, and yet none in which they were more interested.

Mr. WOOD thought that was a very proper time to discuss what should be done to benefit the farming interest. Mr. Sydney had pointed out several measures which would benefit them; but the question arose, how they were to bell the cat? (Hear, hear.) His opinion was, that the most likely means of attaining the end was for them to meet together more frequently in that club and other associations of a similar character; and they ought to embody that sentiment in the resolution to be adopted that evening. It was impossible to lay too much stress upon mutual association (Hear, hear). He thought there was now an opening for that Club to take the position which it ought to assume. He was satisfied that it ought to exercise a much greater influence in the country than it did.

Mr. CHEETHAM in reply, said he was no friend to corn-rents as recommended by Mr. Baker, believing them to be fallacious; for instance, 1834, 1835, and 1836 were years of great abundance, and rents under that system would be low; but in 1837, 1838, and 1839 years of comparative scarcity, rents would be high, without the farmers' means of paying them being improved. With respect to mildew and blight, it had been argued that it was not proper to manure for wheat, that blight arose from the air, and so on. If that view were correct, he would like to know why one field was attacked with mildew, and an adjoining field entirely free? With respect to malt liquor, he would recommend any one, who doubted whether it was beneficial to the labourer, to read Dr. Paris's work on regimen and diet. He had no doubt that that would convince him. As to the transfer of land, his remarks had been in some degree mistaken. He had not argued against making land more easily transferable: what he said was, that he did not see how tenant-farmers were to be benefited by it. He quite agreed with Mr. Sidney, that entailed estates should be made responsible for their own improvement; but with regard to the subjecting of land to the probate duty, he differed from him *in toto*: as that gentleman had forgotten that land paid eleven out of fourteen millions of local taxation, where then was the justice of adding to its burdens?

Mr. W. F. HOBBS moved the following resolution:

"That the proper course for farmers to pursue at the present time is—*indirectly*, to attend closely to the economy of farming, by the cheaper production of manure and more efficient employment of labour, manual and mechanical; *collectively*, by more thoroughly uniting for an equalization of taxation, to which the first step would be the total repeal of the malt and hop duties."

Mr. PAYNE seconded the resolution.

Mr. BELL expressed his dissent from the spirit of the remarks of Mr. Sidney, and declared it to be his conviction that an increase of production would injure the farmer by keeping down prices. He could not anticipate any permanent relief to farmers from a change in the system of taxation. Mr. Bell, in order to put himself in order, had intimated that he should conclude with an amendment; but he ultimately gave up his intention.

Mr. PAYNE could not admit that it would be wrong to encourage increased production, lest it should lower prices. He contended that they ought, if possible, to make two ears of corn grow where one grew before (Hear, hear). It was only by quantity that they could expect to live.

The resolution was then adopted unanimously, and the proceedings terminated with a vote of thanks to Mr. Cheetham for his lecture.

VARIATIONS IN THE FALL OF RAIN.—ARTERIAL DRAINAGE.—EMBANKMENT OF LOW LANDS.—ENCROACHMENT OF THE OCEAN ON THE NORFOLK COAST.

It has been shown in preceding articles that a knowledge of the quantity of rain which falls in a given time, in any district, is of the utmost importance to the success of works designed for the improvement of its arterial drainage. This varies considerably in different parts of the world, and even within the area of our own little island. The variations arise from many causes—difference of latitude, elevation, proximity to the sea, and form of surface which receives the rain. And first with regard to latitude. The influence of this cause is expressed, according to Humboldt, by the following comparative numbers. The maximum is at the equator, where the annual fall is ninety-six inches, diminishing to eighty inches in lat. 20 deg., twenty-nine inches in lat. 45 deg., and seventeen in lat. 60 deg.

A greater quantity of moisture is raised into the atmosphere by evaporation from an extensive surface of water than from land; proximity to the sea, therefore, or to large lakes, increases the rain-fall. Mountains also increase it, by attracting the clouds, and by augmenting the surface exposed to oblique showers. From the last cause, the sides of valleys receive more than level districts. The average annual fall in England is estimated at thirty-one inches. The variations are from 23 inches in the S.E. at London to 67.5 in the N.W. at Keswick, though 29.2 inches at Bristol, 33 inches at Manchester, 34.4 inches at Liverpool, and 59.2 inches at Kendal. The difference of 8 inches between such near neighbours as Kendal and Keswick is an illustration of the effect of mountains and lakes in augmenting the quantity of moisture precipitated from the atmosphere.

Not only does the quantity of rain vary with the locality: it varies, we need scarcely say, in the same locality, with the season of the year. If we examine the monthly averages for a given number of years, we shall find that in our country more than two-thirds of the annual fall are received during the last six months of the year. The mean monthly quantity, however, does not indicate the monthly proportion for any one year, which varies considerably for the same month of different years, just as the rain-fall of different latitudes varies, and as the annual amount varies from year to year. From a comparison of eight years in the same locality, it appeared that May was the month of greatest, and February that of least variation.

The quantity of rain which falls during the year, the manner in which it is distributed over the different months, and the average number of wet and dry days which may be expected in each, are points of the utmost importance to the agriculture of a district, as defining the course of husbandry best adapted to it, the arrangement of the work of cultivation, and the force of men and horses required to complete it in due season. In arterial drainage, however, the questions of the greatest importance are the maximum fall in twenty-four hours, and the proportion of this which in that space of time enters the rivers which drain the district. According to the generally received opinion, these quantities are 1½ inches as the rain-fall, and one-third of this, or half-an-inch, as the quantity which flows off by the rivers. This opinion may be regarded as confirmed by some experiments made by the Government in 1831-2, to determine the greatest rise of floods in Lough Neagh. When not influenced by winds, this did not exceed 4½ inches in twenty-four hours; while the rain-gauge registers kept in the district showed that 1½ inch of rain occasionally fell in twenty-four hours. One-third of this should have raised the waters of the lake, after allowing for the discharge by the Lower Bann, considerably more than the observed rise. The difference is accounted for by local circumstances. In the first place, the greater part of the catchment basin is very little raised above the lake, and consequently the rain flows slowly off the land. Secondly, the more elevated portions of it are remote, and a longer time than twenty-four hours is required for the descent of the surplus waters. Both these conditions tend to increase the proportion carried off by absorption and evaporation. In point of fact, there are in every district many circumstances which tend to produce variations in the quantity of water received by the rivers in twenty-four hours, and on this point we require a series of observations extended over a number of years. The same remark applies to the variations in the quantity of rain which falls at different places under the same latitude. Careful observations on this point are wanted at well-selected stations, carried on for many years on a uniform system, with instruments of the same construction and registered on a uniform plan. Considering the importance to agriculture of good meteorological observations, surely this is a subject well worthy the attention of

the Agricultural Society of England: there must be among that numerous body many members qualified to make these observations, who would gladly make them if supplied with the necessary instruments. The question is of equal importance as regards the drainage and supply of water necessary for the improved sanitary condition of our towns. The Government might therefore be very fairly called upon to provide the rain-gauges, barometers, thermometers, and registers, the selection of which should be made under the advice of the Royal Society. From such a combined system of operations valuable results could not fail to be obtained; but time and patience would be required before the harvest could be reaped.

The embankment of lands lying below the level of high water is a duty devolving on Commissions of Drainage, in which they too generally display quite as much incompetency as in works of arterial drainage.

In works of this kind, however, even most engineers have much to learn from those geologists who have made the action of the sea upon its coast their study. The prevalent error consists in giving too steep a seaward slope to the embankment, and too great a preference to solid structures of masonry and timber, over such apparently unresisting materials as sand and shingle properly disposed—that is as Nature disposes them. Whoever will take the trouble to observe the destructive and conservative action of the sea upon the land, will find the destructive powers to be greatest where high land opposes an abrupt resistance, and the conservative action the greatest where the waves spend their fury in rolling up the long slope of a low shore. There the breakers pile up barriers against their own encroachments. It is the old story of the oak and the bulrush over again—the former rooted up by the blast, the latter escaping its violence by bending before it.

When waves break upon land rising abruptly above the sea level, they exercise a twofold destroying power, caused by their battering and their grinding action. Their battering action is the effect of the momentum of the moving body of water, which is the product of its mass and the velocity with which it moves, both depending upon the force of the wind which impels the wave. The grinding action of the breaker is caused by the sand and small pebbles which they hold in suspension; this wears and polishes the hardest rocks, and scoops them out into hollows and caverns. The battering action undermines the base of the cliff, producing falls of the overhanging upper portion. It operates more or less on the hardest rocks, even when they are most uniform in their composition. The combined battering and grinding

action is greater when the rocks are composed of several minerals of different degrees of hardness—greater still when the cliffs consist of strata of compact stone alternating with others of friable sandstone or soft shales; particularly when the yielding strata are the lowest. It is greatest of all when the coast is bounded, as near Cromer in Norfolk, and in the district of Holderness in Yorkshire, by cliffs of incoherent sand, clay, and gravel, abounding in springs. These cause extensive landslips, and thus materially aid the battering action of the waves.

Falls of rock frequently arrest for a time the work of destruction, by piling up at the base of the cliff a sloping talus, against which the waves break harmlessly. The respite, however, is only temporary; if the coast is swept by a tidal current, in time it removes the fallen matter, and the cliffs again give way as soon as they are exposed to the storm and deprived of the protecting slope.

Let us now take our stand on some low shore, and we shall see the same agencies producing very different effects. A shallow sea agitated by storms tears up the sand and pebbles which form its bed. Part of these are projected by the breaker beyond the reach of the retiring wave; a ridge of loose materials is thus formed. The rise and fall of the tide during intervals of calm arrange these materials with a gentle slope towards the sea. Watch the breaker now on this sloping shore; see how its strength gradually dies away as it ascends the slope. How different from its surging and foaming and boiling against that projecting point of rock! It is now low water, and an extensive strand is exposed to the fury of the gale; the finer particles of sand are driven inland by the winds, and heaped into dunes or mounds of blown sand. *Arundo arenaria*, called in some districts marram, in others bents, quickly establishes itself, and holds the incoherent mass together by means of its creeping roots.

Such shingle beaches and sand hills, piled up by natural forces, form in many cases barriers sufficient to exclude the sea from large tracts of alluvial land lying below the level of high waters, particularly near the mouths of rivers.

A beautiful instance of the benefit which the engineer may derive from this kind of geological knowledge was furnished by the success of William Smith, the father of English geology, in stopping an extensive breach in such a barrier of sand hills, which forms the only protection to a large tract of valuable land bordering the Yarmouth estuary. There is conclusive evidence that this alluvial tract, which lies several feet below the level of high-water, and has a very limited outfall at low water, constituted in Roman times a broad estuary,

extending to Norwich. The site of Yarmouth itself was, in the ninth century, a sand bank separated by a channel from the main land.

By the processes which have been described above, a beach and line of sand-hills accumulated, stretching from the Denes at Yarmouth to near Eccles, where cliffs of boulder, clay, sand, and gravel commence, and extend by Cromer to Weybourn, with heights varying from something less than 20 feet to nearly 400—by these sandhills the sea was excluded from the estuary, and its oozy bed became converted to rich marsh-land.

In the year 1800 a storm of unusual violence effected several breaches in this barrier, which gradually increased in size, till their collective length exceeded a mile. Forty thousand acres of valuable land in the counties of Norfolk and Suffolk were thus inundated, and there appeared every prospect of the marshes being again converted into an estuary. Smith, who was at the time embanking and laying out water-meadows for the late Lord Leicester, was called in. He found the commissioners engaged in a vain struggle with the elements, which they were attempting to controul with walls of masonry and breakwaters of timber, swept away by the angry sea as fast as they were erected. It was three years before he could induce them to deviate from the established routine, and to adopt his plan of stopping the breaches with sand and shingle—a plan which was deemed about as rational as that proposed in the old nursery rhymes for building up London Bridge with turnip-tops. At length he prevailed upon some of the most influential of the commissioners to accompany him to the shore. He there showed the process by which Nature had formed the barrier, and explained the means by which he proposed to aid Nature in re-establishing it. The astonished commissioners exclaimed, "Oh that none of us should have thought of this before!" Armed with full powers to pursue his own course, Smith now commenced by laying down faggots to assist in retaining the sand, which he carted from the highest parts of some of the neighbouring sand-hills. In forming his embankment of loose sand, he gave it the slope which he had observed to prevail on the neighbouring shore; namely, twelve to one on the side of the sea, and four to one on the side of the land. As fast as it was completed to this form, he protected the seaward slope by a covering of coarse shingle, such as he had observed to remain unmoved during the most violent gales. In this manner the breaches were cheaply and effectually stopped in less than a year, and the machinery set to work for pumping out the water; for these marshes lie so low that it is necessary at all times to remove a large portion of the land water by machinery.

These unresisting slopes of sand and shingle have hitherto resisted the most furious storms of the German Ocean: but they are now threatened with a new danger, from the rapid destruction of the line of cliffs which form the support of the sandhills at their northern termination. The average waste of these cliffs is at the rate of a yard a year, along their whole range; but at times, and in some parts, is much more rapid. At Sherringham, for instance, seventeen yards were swallowed up in five years, and a depth of twenty feet of water was formed where, forty-eight years before, there had been a cliff fifty feet high. A few years ago the jetty at Cromer was swept away during a violent storm, many houses destroyed, and the safety of the whole town endangered. At Cromer the cliffs have been secured for a time by expensive works, which have entailed a heavy annual rate on the town; but the low cliffs near Eccles are fast melting away. They will soon be cut back entirely, so that the sea will have access to the low tract behind them. The tidal current will then take the sand-hills in flank, and sweep them away; producing great changes in the form of that part of the coast. The consequences to the marshes and the town of Yarmouth will be most destructive. The owners of property there are consequently quite as much interested in the defence of those cliffs, if they can be defended, as the lands which border their edge, and the towns and villages which stand upon it.

We adverted, in a former part, to the dangers which threaten the town of Yarmouth and the adjoining valuable marshes, from the liability of the sandhills by which they are protected, to be swept away when the continued cutting back of the low cliff against which they rest, at Eccles, shall permit the tidal current to take them in flank and rear. The subject occasionally excites considerable alarm in the neighbourhood; and then sinks into oblivion, apparently from despair of a remedy, and from a hope that the danger, if inevitable, may be remote. The local interests at stake are great; and there are other parts of our coasts similarly circumstanced. The subject, therefore, possesses more than a local interest; and we resume it for the purpose of inquiring whether there is any remedy, of offering a few suggestions, and of eliciting discussion.

The safety of the sandhills depends, as we have said, on the maintenance of the cliffs which support their northern flank. The rapid destruction of the cliffs, again, arises from two causes: first, the battering of the sea, aided by the percolation of springs to produce landslips; and, secondly, the strong tidal current, called "the flood tide from the north," which sweeps the coast, and removes the materials of the cliffs as fast as they fall. These

materials, borne southwards by the current, have choked up the ancient estuary of the Yare, with the exception of the narrow channel which has been deflected several miles towards the south, by accumulating banks. They have formed the point at Lowestoffe, called the "Ness;" and that minor point of low land north of Yarmouth, called "Winterton Ness." If these materials could be retained on the spot where they fall, they would protect the cliffs, and convert their face into a grassy slope, like that of the ancient cliff at Lowestoffe, now abandoned by the sea, and protected by its Ness. The work of defence would be comparatively easy but for this tidal current. It would be merely necessary to reduce the face of the cliff and the shore to a regular slope. The cliffs contain, as we shall hereafter show, resources which would go far towards defraying the cost of the necessary embankment. The tidal current, however, acting along the line of the embankment, would sweep it away; and works would therefore be required to arrest the shifting shingle. The works usually adopted for this purpose are breakwaters of timber placed across the beach. A substitute more in accordance with the operations of nature would be the formation of artificial nesses, or low points of land, sloping in all directions towards the sea; the slope being protected with a pitching of stones, or with heavy shingle. A ness is a low triangular point of land, formed by a series of concentric ridges or embankments, inclosing small areas. The ridges consist of heavy materials, thrown up by gales of unusual violence; and the intervals between them become filled with blown sand, which is speedily covered with marine vegetation, to be replaced, after a time, by a better description of herbage. Lowestoffe Ness, formed in this way, projects nearly half a mile from the face of the former cliff, and has a length of nearly three miles.

If we examine a wasting line of cliffs, like those of Cromer, it will be found that the whole line is not wasting at the same time, but that destruction is going on rapidly at some points, and accumulation taking place at others, and that the points of destruction and accumulation are in a state of constant but gradual change. By taking advantage of those parts where there is a disposition to form low spits of land, and strengthening them in the manner proposed, and by throwing out minor low projections at intermediate points, we should have the best hope of forming a sufficient tract of low ground in front of the present coast, and of deflecting the tidal current. Much of the success of the operation would depend on the gradual manner in which this artificial ness could be made to advance into the sea. Its progress should be almost as gradual as the formation of a natural ness. A

projection thrown too far out, or too abruptly, would either be carried away, or, if permanent, would only turn the current against a neighbouring part of the coast.

These, then, are the means by which we propose to defend this important coast-line against the encroachments of the ocean—a railway to Norwich, in order to carry the clay into the interior; the removal of the clay which constitutes the base of a large portion of the cliffs; its sale for the improvement of the land; the cutting back of the cliff, and the disposition of the sand and shingle which cover the clay, so as to form an embankment in front of it; and, lastly, the strengthening of this embankment by means of counterforts of low ground advanced into the sea at intervals in front of it. But who will undertake this work? If, as we have said, the safety of Yarmouth and the marshes depend on it, there is a much more valuable property at stake there than along the line of the cliff's themselves. Their average waste, at the rate of a yard a-year, along twenty miles of cliff, gives little more than seven acres as the area annually destroyed. The fee-simple of this cannot be estimated at more than £35 an acre, on an average, though some is worth much more. For estimating the annual loss from destruction of houses we have no data. It is clear, however, that the owners of property distant 100 yards from the edge of the cliff may deem themselves secure for nearly 100 years against an action of ejection by the ocean, and would be ill inclined to incur expense to diminish contingent danger at the end of that time. Even those nearer the sea are more disposed to retreat inland before its advance than to make much exertion in maintaining what they deem a hopeless struggle with an invincible foe. The value of the clay washed into the sea is much greater than that of the land destroyed, were there a market for it, which, with the present means of carriage, there is not. It sells at present, in limited quantities, at 6d. the cubic yard on the shore, and 1s. on the summit of the cliff. If we suppose it to average seven yards in depth along the whole line, there would be washed annually into the sea 246,000 cubic yards, worth, at 6d. a yard, £6,000 a year. This quantity would be sufficient, at the rate of 20 cubic yards to the acre, to fertilize 12,000 acres of land. It might be carried thirty miles on a railway for less than it costs to cart it six miles as it is conveyed at present. The tract of country which the railway would open up to this clay would be capable of consuming nearly as much as that annually. Much of it is now supplied with an inferior marl or clay, either raised on the spot from beneath a considerable head of uncallow, or conveyed more than forty miles on an

expensive inland navigation, and then catted in many instances five miles more. Farmers who have used both have declared to us that if they could purchase the Cromer clay, delivered at the cost we calculated on, namely, 1d. per ton per mile, they would prefer it to the white marl, consisting principally of chalk, raised upon their own land.

To a number of our readers these views will, without doubt, appear somewhat extreme. That has been the first impression on every one to whom they have been communicated; but we never met with any Norfolk farmer, conversant with the neighbourhood, and aware of the extent to which the use of clay as a manure enters in that county into agricultural practice, who did not change his opinion, and admit the practicability of the plan upon going into calculations.

We may have over-estimated the average depth of clay available for agricultural purposes, having never made an examination of the cliffs for that purpose, often as we have visited them with other

objects. That there is a very considerable quantity, does not admit of a question; and it is equally certain that it commands at present the price we have mentioned.

Considering the large property endangered by the continued waste of these cliffs, it is well worthy the serious reflection of those whose interests are at stake, whether it may not be advisable to have all the questions raised in this article investigated by competent persons, in order to ascertain whether this or any other plan of defence is practicable, or whether they have only to sit, with folded arms, waiting, with Turkish fatalism, a catastrophe which is inevitable, and probably not very distant.

The present abundance of capital offers great facilities for the undertaking, whether to be conducted by a commission or a joint-stock company; and the owners of property in Yarmouth and in the marshes are, we repeat, more interested in upholding these cliffs than the landowners whose estates they bound.

## THE FOOD OF PLANTS.

Vast progress is now manifested in the discoveries made in the science of chemico-physiology. The direction once given to scientific investigation seems likely soon to be productive of amazing results. Step by step great advances are being realized, and the theory and rationale of all the physical sciences involved in cultivation—and which are not?—are being more and more clearly understood.

Sir Humphrey Davy, some thirty-eight years ago, showed—though himself of opinion that the food of plants passed mainly, if not entirely, through their roots—that the vapour of decomposing dung had a greatly invigorating influence on plants in their natural state. Liebig following, demonstrated that plants took up carbon from the atmosphere in the shape of carbonic acid gas diffused through the air in which they were enveloped; and subsequently he showed that ammonia also existed in rain-water, and was brought down by it in very uniform and appreciable quantities. Fresenius, in his work published in German about three years ago—and which we much regret has not yet been translated, though we think Messrs. Longman announced such an edition—proved that certainly sulphur existed in the atmosphere, and phosphorus, the one as sulphuretted and the other as phosphoretted hydrogen; and, more recently still, the French chemist, Barral, found not only nitrogen and nitric acid in rain-water, in the vicinity of Paris, with the ammonia before detected, but chlorine, lime, and magnesia. Here, therefore, is a source of supply

of the cultivated crops which is nearly equal to an ordinary produce, and obtained from, and brought down by, rain-water alone. Now, when we reflect that the mineral portion of our cultivated crops amounts to little more than two hundred to three hundred pounds per acre, we see no great difficulty in assuming that if the soil were in a proper position to retain the materials brought down by the rain, there might be enough to supply at least some cultivated crops with all their elements, and all kinds of culture with some of their constituents. The claying of an open and porous sand or gravel will do for it all chemically what its openness to admit the oxygen will do for it mechanically; and the deepening of this retaining and pervious medium will just increase the chances of the greater detention.

And if all are not supplied, the plant becomes a transmuting agency, which can substitute lime for magnesia, and probably soda for potash when these are deficient. A writer in the "Transactions of the American Agricultural Association" says—"There exists an unquestionably isomorphism amongst many of the mineral bodies, thus—potash, soda, oxide of ammonium, and hydrate of lime; lime and magnesia; sesqui-oxide of iron, sesqui-oxide of manganese and alumina; sulphuric and selenic acids; phosphoric and arsenic acids; are respectively isomorphous groups. Hence soda may replace potash; hydrate of lime may be present in place of either soda or potash. That this displacement or substitution does occur in nature is

abundantly proved. Thus soda has been found to replace the potash of the oak in Long Island, on the sea coast. Marine plants, as the Salsosas, transplanted to an inland situation, are found to contain potash. Tobaccos from various sources, analyzed by Berthier, yielded potash as a base, while specimens examined by Fresenius and Will yielded 60 per cent. of lime and magnesia salts." But the cultivator wishes to stimulate parts of a plant. The tuber of the potato has been stimulated till the other fruit—the "apple"—has disappeared from all our fields, and has become now a rare product. We cultivate the bulb of the turnip—the seed of the wheat; and these parts require varying quantities of different materials. Again, "The different parts of the same plant yield an excess of dissimilar salts: the potato tuber contains 86 per cent. of potash salts—the tops 61 per cent. of lime salts. In the same way, the roots, foliage, and seeds of other plants give indications of an affinity for different minerals. Hence it follows that analysis will differ with the nature of the soil on which the plant has been produced, and with the part examined, or, if every portion be examined, with the part used in excess. As it is usual to publish the mere analysis without designating the soil, or variety of the plant, it is necessary in arriving at trustworthy conclusions to look somewhat further than this. Therefore, in reaching my position, I have kept in view two points—the natural habitat of the plant, and the circumstances under which its produce becomes of great excellence. Thus in the analysis of the onion by Fourcroy and Vauquelin, lime salts predominate; Cadet found 64 per cent. of potash salts in the garlic; but I venture to place the family to which the onion belongs (*Asphodelaceæ*) among the soda plants, because it is well known that asparagus, many kinds of onion, and other genera, are indigenous to the sea-coast and salt marshes, and because the Spanish onion, which excels all others, is cultivated in lands irrigated by salt-water. Cruciferous plants are soda plants characterized by a remarkable affinity for sulphur; yet in the analysis of the ashes of turnips and cabbages, they appear to be potash plants, that base acting as a substitute; I arrive at the conclusion that they prefer soda, from the fact that cabbages and many other cruciferous plants delight in situations near the sea-shore. A gentleman well known to this association has recently shown that the grapes cultivated near the low salt plains of New Jersey contain soda instead of potash salts, and are, in consequence, of a very inferior flavour. Another interesting case of the influence of the bases on the flavour of plants exists in the case of tobacco. The French government agents, finding that the tobaccos from the United States

had become decidedly inferior to the old samples, submitted specimens to the examination of M. Pelouze, who ascertained that lime salts predominated in the inferior specimens in the place of the potash salts obtained by Berthier." The agriculturist, however, must not depend on the atmosphere alone when he cultivates a part of a plant, requiring more of any given element than the atmosphere will supply to a soil, how capable soever it may be of retaining manure. Barley, for instance, contains eight per cent. of soda, while its straw presents little more than one-half per cent. Wheat contains nine per cent. of that material, while its straw affords only a trace. An acre of wheat will remove 15 lbs. of phosphoric acid from the soil, while 5½ lbs. will suffice for the straw. An acre of barley will carry away nearly 21 lbs. of phosphoric acid, while its straw will not remove more than 5 lbs.

This accounts for the fact of which farmers often complain, that they can get plenty of straw but very little corn. One man declares that his turnips are "all top," who has probably a soil deficient in potash, for the top requires but 28 per cent., while the bulb requires 41 per cent. The case is still more exaggerated when potatoes are taken by the acre. The tubers of an acre of potatoes will carry off 222½ lbs. of potash, while the tops require only 50 lbs. Hence, if all the manure necessary to a crop of potato tops is present, and the potash is deficient, and not fully supplied with its chemical substitute, we may expect to see large and vigorous tops and small deficient tubers. The transatlantic authority above quoted gives a valuable list in a table, which we have taken the liberty of adapting to our more advanced knowledge.

Plants requiring much azotem the soil	Seed bearing,	Lime,	Hempseed, cotton, hop, cultivated peas.
		Potash,	Corn, mada, wheat, rice, oats, barley.
Foliage or root crops,	Soda with sulphur,	Lime,	Rapeseed, colza, mustardseed, linseed.
		Potash,	Tobacco, potatoes, hemp, indico, madder
Plants requiring little or no azotem the soil	Seed bearing,	Phosphorus and soda withsulph.	Sugarcauc, carrots, parsnips, mangel-wuriz-l, beets, spinach.
		Lime,	Turnips, kohlrabi, ruta baga, cabbages, onions, asparagus.
Foliage or root crops,	Potash,	Lime,	Field beans, pindars, vetches.
		Potash,	Rye, German and Polish millet, buckweat.
Foliage or root crops,	Lime,	Potash,	Pomaceous fruits, lupines for following clovers, spurry, tares, lucern, sainfoin; all cut before seed.
		Potash,	Meadow grasses, Jerusalem artichoke.

The table presents the groups of plants to be employed in rotation, which are variously ex-



hausting of saline matters, and exhausting or ameliorating as respects azote.

While new discoveries are going on as to the amount of the elements of plants present in the atmosphere, it is remarkable how others are constantly made of their being in the soil in unsuspected quantities. The atmospheric chemists, as opposed to the root-absorbing advocates, are vying with each other to make their theories sustainable by facts, and probably the result will be that both are partially right and both somewhat too one-sided in their respective hypotheses.

The real truth is, that plants take in food both from their leaves and their roots, and derive it both from the soil and from the atmosphere, but what proportion of each is as yet by no means settled. Liebig astonished the world by showing that a soil contained more ammonia than was necessary to supply any one crop, making it evident that the whole of the materials in a soil were not available to the plant. Nor can this depend, as far as ammonia goes at least, on its degree of fixation. *Theory* shows that a clay soil will detain equally the ammonia passed through it in solution, whether as a fickle carbonate, or a more stable and less volatile muriate, or even sulphate; and *practice* also confirms the fact that the one is just about as effective in producing a crop as the other.

But it seems certain that, whether the roots or the leaves, or both, are the main appropriating apparatus of plants, the materials required must be brought within their influence. Much as the roots of plants may ramify, it seems clear that their fine filaments do not altogether pervade the soil, and therefore there are parts where the roots can have no influence. On the other hand, it is abundantly clear that the most favourable of manures may be applied in a state by far too concentrated to be of service. We well remember how we were personally disappointed in the first cargo of guano ever imported into Hull. So minute a portion must, we thought, be drilled religiously close to the seed. We drilled it for Swede turnips with the seed. It killed 90 per cent. of the seed; and though the odd plants which came up were a sickly and stunted effort at vegetation at first, they certainly ultimately became highly luxuriant. Between the two extremes of too great concentration and too minute diffusion some proper medium must be found in the practical application of all classes of fertilizers; and between the same extremes of diffusion and concentration the natural fertility of the soil ought to be kept. M. Boussingault, along with M. Lewry, has made some recent experiments to test the quantity of carbonic acid present in soil. That it is soluble in water, and in that state carried out

of the atmosphere—that it is given off by all kinds of decay in the soil—that it is forced into the soil from the nostrils of the sheep and cattle, who feed close to the surface of the ground—is what we have always believed, and often stated.

He detects it in his *favourite soil*; the grand medium, in his estimation, of conveying food to plants. In one French hectare (about two acres and a half English) of arable land manured during a year, and taking the depth of a soil at thirty-five centimetres (about fourteen inches English), he found there was as much carbonic-acid gas as is contained in 18,000 cubic yards of the air of the atmosphere. Thus, reckoning the proportion of carbonic-acid gas in that bulk of the atmosphere as from four to fourteen ten-thousandth parts of its volume, in the air of a hectare of arable land *recently* manured, as much carbonic-acid gas would be found as would be contained in 200,000 cubic yards of the air of the atmosphere. Then in the loam subsoil of a forest to the depth of thirty-five centimetres the confined air contains carbonic-acid gas equal to that in 5,000 cubic yards of atmospheric air.

The three conditions of soil indicated are, as we take them:—1. Soil to which manure has been some time applied, as indicative of the power of a soil to hold and retain that important constituent of plants. 2. Soil which has received a fresh supply of manure, showing the capability of manure, as conveying carbonic acid gas to the roots of the plants, equal to a very large supply of that of the atmosphere; and, 3. Soil in which carbonic acid gas has simply accumulated by the mere operation of natural decay alone.

Enough, we think, has been made out to show that, whatever the atmosphere may contain and convey, the roots are supplied with a very abundant quantity of the important element of the turnip plant—to wit, from that substance existing in the soil.

Late writers have forgotten the Decadolleian theory of radicle exudation. The researches of the Highland and Agricultural Society of Scotland, though too tedious to take as a whole, ought not, as far as their results go, to be forgotten. The following were their conclusions, deduced from experimental researches on the radical excretions of plants:—

1st. That the commonly cultivated plants of the natural orders, graminæ, leguminæ, and cruciferae, excrete by their roots soluble matter.

2nd. That the excretions consist of both organic and inorganic matters.

3rd. That the organic portion principally consists of oxygen, hydrogen, and carbon, existing as gum and mucilage, and in some plants also of a volatile matter, or oil, possessing the odour of the plant from which the excretion is obtained.

4b. That the inorganic matter consists of saline and earthy salts, having an alkaline reaction, and containing lime, sulphuric acid, and chlorine, with potash or soda.

5th. That the quantity of excretion thrown off by any single plant is very small, and excretion can only be satisfactorily examined when collected from a number of plants.

6th. That plants having large and spongy extremities to their roots yield more excretion than plants which have slender, thread-like roots.

7th. That the excreted matter is similar in its composition and reaction, with tests, to the sap of the plants from which the excretion is obtained.

8th. That the probable cause of excretion from the roots of plants depends on an exosinose action, which goes on simultaneously with the absorption of water and saline matter by the spongioles of the roots.

9th. That plants absorb metallic salts when in solution in water, and that they quickly die unless the solutions are very largely diluted.

10th. That the salts of barytes are equally injurious to vegetables when taken into their texture as the metallic salts; but that those of strontia, lime, magnesia, and the alkalis do not act as poison unless the solutions are comparatively strong.

11th. That plants, after the absorption of metallic salts by their roots, excrete in some instances traces of them; but they are more generally decomposed in the structure of the plant, and retained.

12th. That seeds impregnated with poisonous

substances may germinate if the quantity of the poison be very minute, but in most cases the seeds perish.

13th. That plants are not injured by their excretion being re-absorbed into their structure, as was supposed by M. de Candolle.

14th. 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.

These views seem to have been of late entirely overlooked; but, though we cannot follow the misty theories of De Candolle, still we would make all proper allowances for his extreme views, and confess that there is something in the general principle which will one day tell on the art of cultivation. The American Transactions above referred to thus speak on the supply of root food:—Under natural circumstances all the grain-bearing plants require little azotised matter; but from the development which many, such as wheat and barley, have acquired, they have become azotised plants, and are not to be maintained in their present state without a large supply of this food made to the roots. Many garden vegetables are also of this kind. The cabbage in nature consists of a few tough leaves, and inhabits soils of ordinary fertility on the sea-side; its present luxurious development, by which it attains a weight certainly a hundred times greater in several varieties, is the result of supplying food to the root in tillage; and if the supply be diminished, the characteristics of the variety are soon lost, and the vegetable degenerates.

## BUTTER MAKING.

The object in churning is to break up the little globules of butter. This is done by continued dashing and agitation; when it has been continued for a certain time the butter appears, first in small grains, and finally works together into lumps.

Where cream is churned, the best practice seems to be to allow of its becoming slightly sour.

In many dairies the practice is to churn the whole milk. This requires larger churns, and is best done by the aid of water or animal power. It is considered to produce more butter, and this is said by some to be finer, and of better quality. I do not think that there have been any very decisive experiments upon this point.

The excellence of butter is greatly influenced by the temperature of the milk or cream at the time of churning; if this be either too hot or too cold, it is difficult to get butter at all, and when got it is usually of poor quality. A large number of experiments have been made with regard to this point, and the result arrived at is, that cream should be churned at a temperature when the churning commences of from 50 to 55 degrees of Fahrenheit's thermometer. If whole milk is used, the temperature should be about 65 degrees F., at commencing. In summer, then, cream would need cooling, and sometimes in winter a little warmth. It is surprising how the quality of butter is improved by attention to these points. Some churns are made double, so that warm water or some cooling mixture, according as the season was winter or summer, might be put into the outer part. It will be seen, that in

whatever way the temperature is regulated, a thermometer is a most important accompaniment to the dairy.

The time occupied in churning is also a matter of much consequence. Several churns have been exhibited lately which will make butter in from three to ten minutes; but the most carefully conducted trials on this point have shown, that, as the time of churning was shortened, the butter grew poorer in quality, was soft and pale, and did not keep well.

If great care is not taken in washing and working, when making butter, some buttermilk is left inclosed in it.

No matter how well the butter is made in other respects, if buttermilk be left in it, there is always a liability to become rancid and offensive. When packed in firkins, it will be rancid next their sides and tops; be injured to a greater or less depth, as the air may have obtained access. Salting will partially overcome the tendency to spoil, but not entirely, unless the butter is made so salt as to be hardly eatable. Another reason for much of the poor butter, which is unfortunately too common, is to be found in the impure quality of the salt used. This should not contain any magnesia or lime, as both injure the butter—they give it a bitter taste, and prevent its keeping for any length of time. Professor Johnston mentions a simple method of freeing common salt from these impurities. It is to add to 30lbs. of salt about two quarts of boiling water, stirring the whole thoroughly now and then, and allowing it to stand for two hours or more. It may be afterwards hung up in a bag and allowed to drain. The liquid that runs off is a saturated solution of salt, with all the magnesia and lime which were present. These are much more soluble than the salt, and are consequently dissolved first.

Want of caution as to the quantity of salt used, and of care in separating the buttermilk, cause the spoiling of very great stocks of butter every year.—From Professor Norton's "Elements of Scientific Agriculture."

AN HISTORICAL RESEARCH AS TO INOCULATION AS A PROTECTIVE IN  
THE EPIZOOTIC PNEUMONIA OF CATTLE.

BY DR. BOINET.

In an interesting communication, published in the *Gazette Medicale*, on inoculation as a protective in the epizootic pneumonia amongst cattle, it was mentioned that the question had been brought before the Academy of Belgium, and that a government commission had been appointed to investigate the question. I believe that the French government is also engaged with the subject, and have even offered a prize for the best essay on it; also, that savans of our country have been sent to Belgium to investigate the results of the discovery. Without wishing to disparage the value of the methods of inoculation used by the Belgium physicians, it appeared to me interesting to inquire how far the plan is novel, and to show the different experiments that have been performed at different times with the same object in view. It is the result of these inquiries I have the honour of now bringing forward. The first use of inoculation, as a protective in this disease, has been ascribed to the English; but the credit of it cannot be refused to Camper, a celebrated Dutch physician, who first particularly drew attention to the matter, and made a series of experiments on this important subject. The experiments of Dodson, Layard, and Bewley, in England, of Grashuis and Sandifort in Holland; also those of Noseman, Kool, and Tack, although performed with ingenuity, have not obtained confidence. The same may be said of the experiments made in Denmark, Brunswick, and Mecklenburgh.

But before we describe the results of these trials, it will be necessary to say a few words as to the investigations of Camper, Vandœvrans, and Munnicks, in this matter, as all the rest have followed in their footsteps.

Camper commenced by inoculating calves, then heifers, and finally all horned cattle up to three years old.

He found that cows in calf, for the most part, aborted from the effects of the disease, which has also been observed in France, for which reason he recommends that they should not be inoculated. But, notwithstanding all his precautions, he was not able to save more than one half of the inoculated cattle, and the per-centage was frequently below that.

Camper was not discouraged, and his perseverance was ultimately crowned with success. I cannot give a better idea of his researches than by

quoting the account given of them by Munnicks. It is to him that Camper intrusted the completion of his experiments, and to him, therefore, we may fairly look for information on the subject.

The description which Munnicks gave of the epizootic of Holland manifestly coincides with the disease which prevails in the Belgic provinces, the symptoms being identical. Munnicks proceeded as follows:—

He made use of a large, double thread, saturated with the discharge which flowed from the nostrils of a beast afflicted with this disease, while the affection had not attained its most advanced stage. The most recent matter is to be preferred; and when it is possible to employ it before it has lost all its heat, the result will be more certain.

Munnicks having passed this thread through the eye of a sharp, flat needle, a little curved towards the point, and about two inches in length, he introduced it under the skin of the thigh; he directed it perpendicularly, so that the exit of the purulent matter would be the more easy, and brought the needle out, after having traversed about one inch. He knotted the ends, as is done with a seton, and left it in for from twelve to twenty-four hours, which time will be sufficient for its communication, if the animal is susceptible of it.

There is no change to be seen for five or six days. The appetite continues unaffected; but some beasts will not take their food in the interval of the fourth to the fifth day.

About the seventh day the milk commences to be scarce, the eyes swell a little, and the conjunctiva is inflamed.

Grinding of the teeth, shivering, and loss of appetite are also observed. The ears are at one time hot, at another cold. The dung becomes more consistent.

On the eighth day rumination generally ceases. On the ninth, the animal heaves heavy and frequent sighs; it breaths with difficulty, and the dejections become more abundant.

On the tenth or eleventh day the nostrils are filled with an unhealthy discharge. The crisis usually occurs on the twelfth or thirteenth day.

These observations have been made on more than eleven-hundred horned cattle that Munnicks got inoculated in his presence, and whose disease he watched accurately.

From his experiments he draws the following inferences:—

That, whether he employed for inoculation threads dipped in the discharges of animals slightly or severely affected, the success was always the same; it entirely depended on the constitution of the inoculated animal. This assertion has been contradicted by those who inoculated in Mecklenburgh.

That the course and intensity of the inoculated disease was not changed, whether one, three, or many were used, provided that the trajectory of the thread was more or less considerable, and that it remained long enough in the part; the same took place if cuts were made, and contagious matter introduced into the wound.

That the dog, the cat, and the horse, also the stag and the hind, although these last are ruminants, are not susceptible of this contagion; and, although inoculated, do not contract the disease.

That the skin, the flesh, and the fat are very virulent, even several days after the death of the animal.

That the excretions which yield the most contagious matter during the disease are inert during convalescence; and, what is well worthy of remark, in cases where a well-marked crisis occurs, immediately after that has taken place the excretions cease to be contagious, and are no longer fit for inoculation.

Lastly—and this result is a very important one—that the advantages of inoculation, performed with the greatest care, were not sufficiently successful to be published and looked on as an efficacious preservative.

The experiments undertaken by Vicq. d'Azyr, in 1776 and 1777, were analogous to those of Munnicks. They took place on the Condonnais, a district where the disease was very fatal. All the full-grown beasts that were inoculated died. In the suburbs of Auch, where the disease was not so violent, one was saved out of twelve; and the following year, when the disease had lost some of its virulence, three out of ten were cured.

If the proportion of beasts successfully inoculated is larger in Holland than in the central departments of France, it is to be attributed to the fact that in Holland young cattle were chosen, and the disease was of a milder form.

In a very well-written memoir, published in Abbé Razier's journal, Mauduit proposes to try if the nature of pestilential virus could not by some means be altered.

Vicq. d'Azyr is reported to have mixed the contagious matter with different acids, none of which prevented inoculation.

He searched in the pits which contained the re-

mains of the cattle which died of the disease for several months past; and having saturated threads with their discharges, it communicated the disease with great rapidity. He also is convinced, as well as Camper and Munnicks, that a beast cured of the disease is no longer susceptible.

Although the most skilful physicians have in vain exhausted all the resources of their art to render inoculation useful, in Holland, an intelligent farmer, named Geert Reinders, and who had himself practised inoculation, as recommended by Camper, made an observation, from which principles have been deduced on which is founded the present plan of inoculation.

Munnicks gives him credit in his memoir, as also Camper, in a memoir published in 1776, where he attributes to this farmer the honour of being the first who made the following remark:—

Geert Reinders observed that, in a large number of calves which he was rearing, while the disease was rife amongst them, that those born of cows which had previously had the disease and been cured, were very slightly attacked, and all recovered, whilst nearly all the others died. This interesting fact was a ray of light to Munnicks and Camper, who then resolved to recommence their trials on a new plan. Numerous experiments, which would be too tedious to report here, demonstrated the following facts:—That calves out of cows previously attacked and cured of the disease are so constituted as to resist, for some time, the contagion of the disease, and to be easily cured when attacked by it.

That the time they enjoy this immunity being passed, they are liable to be attacked in as dangerous a manner as the others.

That the time in which calves are so disposed is for a short time after birth; that its limits are not determined: it sometimes is prolonged to six months.

That calves so disposed, and who during this time contract the disease, whether by natural contagion or inoculation, are often so lightly attacked, that one would be tempted to believe their health suffered no alteration; yet, notwithstanding, a thread dipped in their humours is capable of inoculating other beasts, which fully proves the existence of the epizootic virus in those calves.

Two obstacles prevent this plan carrying all the success with it which ought to attend it.

The first is, that, not knowing the exact time for inoculation, the operator is liable to inoculate either before the animal has attained the necessary disposition to be affected by the virus, or after this disposition has passed, and at times when the operation may place them in the greatest danger.

To hold a safe course in these extremes, they fixed on the age of a month or six weeks to inocu-

late calves born of cows which had suffered from the disease, and repeated the operation in a month after, if no certain signs of the disease were produced by the first inoculation; sometimes even they repeated the process at the end of the fourth or fifth month, so as not to be misled by the mildness of the symptoms.

By following this process with twenty beasts they lost but one. M. Munnicks declares that, in one year, 1,500 calves were preserved in this way, and during the same year inoculation succeeded with more than 2,000.

After having thus explained with care the experiments of the Dutch physicians, we will now, in the like manner, show the results of those performed in various cantons of Germany.

An author, who is not known, published in 1763 observations made in Brunswick on the inoculation of this disease. According to him that plan is the only one which has had any success in that country. The chief advantage which he derived from it was that, knowing the time the beast would be attacked, it could be prepared for it.

The author recommends to put the beasts on low diet, during which time they are to be bled and purged once; they are then to be inoculated, by introducing a piece of wick, wet with contagious blood, in an opening in the jugular vein, or into an incision made in the dewlap. He recommends the inoculation to be repeated if it does not succeed the first time. In twelve beasts inoculated, at the first trial, six died; in a second trial on eight, four perished—one was killed, and the other three were cured. The humour from the nose, the blood, and milk appeared alike contagious.

The epizootic disease having prevailed in Mecklenburgh from 1764 to 1769, Claus Detlof then made trials which were not very encouraging. He made use of a flat needle, cutting at both edges, to introduce a wick or a sponge wet with the contagious matter. Out of sixteen beasts inoculated thirteen died. Claus Detlof attributed his want of success to having used all sorts of matter, without taking into consideration the malignity of the disease under which the animals whose humours he employed were suffering.

Denmark having been visited by the disease in 1770, 1771, 1772, inoculation was tried by Witer, a surgeon, under the direction of Oeder, professor of botany. Berger, the physician to the king, sent to Camper for instructions, with which the latter immediately furnished him. After several trials, he differed, in some respects, from the method which had been laid down. They made but one insertion in the side, in front of the hind leg, and made use of one thread of cotton, wet with the nasal mucus of an affected beast, taken during the

first few days; because, if the crisis was at hand, or the animal convalescent, the matter is not equally contagious.

Oeder divided the Island of Dawnoë, situated to the south of Zealand, and where he made his experiments into three parts. In the first division were the beasts destined for inoculation; in the second, those inoculated, up to the time when the symptoms appeared; and in the third the diseased animals.

In 1770, 61 beasts were inoculated; 18 were cured, 42 died, and one would not take the contagion. In 1771, 160 were inoculated; 91 were cured, one died, and 68 gave no signs of the disease. In 1772, 149 were inoculated; 123 were cured, 2 died, and 144 were not attacked. The total for these three years amounted to 390 beasts; of which 232 were cured, 45 died, and 103 resisted the contagion. Bergius, a celebrated Swedish physician, in a work which he published on the inoculation of this disease, says, that this affection not being excutematous in its nature, cannot be inoculated with success. The following may support this opinion:—

A company was established at Zevol, in Germany, in 1776, to prosecute inquiries as to the preservation of cattle from contagion; they tried the plan of Geert Reinders. Out of 100 beasts thus inoculated, 20 perished, 12 were severely, and 36 slightly affected; some signs of the disease were perceived in 44, and 8 absolutely resisted it. In the following year, Holle published in the periodicals of Mecklenburgh a discourse, in which he avowed that the inoculation of adult beasts had not been successful.

Finally, the epizootic having manifested itself again in 1776, 1778, 1779, in the Duchy of Mecklenburgh, a rich lord, named De Bulow, resolved to make new experiments on inoculation, the other remedies, both corrective and preservative, being manifestly useful.

De Bulow observed that the disease was benign in some places and malignant in others; he took his contagious matter from the first only. In the province of France, where the disease prevailed, it has showed itself less malignant in some cantons, but the diminution of malignity was never so much that the epizootic could be at all called benign.

Out of 177 beasts, inoculated by the orders of Bulow, at various times, 42 died, and 135 were cured. In one case, where contagious matter had been used taken from a beast very severely affected, all the animals inoculated perished. De Bulow remarked that calves under six months invariably perished, at least unless they were the produce of cows which had had the disease and had been cured.

Encouraged by this example, Claus Detlof, Grand Seneschal to the Duke of Mecklenburg, made like experiments on his estate, in 1778. Out of 131 beasts inoculated in October, 43 died, and 88 were cured. Detlof observed that it was dangerous to inoculate beasts fatigued by a long journey, or weakened by change of diet.

Detlof relates that an assurance company was formed in Mecklenburgh for inoculation, but he does not tell the conditions; this would seem to prove that there was a decided advantage in the plan of inoculation. In general the authors have been sufficiently clever to explain the want of success; but none of them to discover how to prevent this defect. Claus Detlof lays it down that the inoculated disease is always less dangerous than the natural one; that cows in calf, and calves under six months, are very severely attacked; that it is very dangerous to inoculate beasts that have before contracted the disease. The contagious matter should be taken from an animal suffering from a mild and benign form of disease; it cannot be kept more than fourteen days, even in winter—a time which does not agree with that which Munnicks determined. The infection should be inserted into the back and side of the animal; and if the pus has not sufficient exit, the author advises incision to be made for that purpose.

The disease thus inoculated will appear on the seventh or eighth day—the cough, dulness, want of appetite, and diminution of milk are the first signs. There are two which ought to be looked on as characteristic of the disease; these are inflammation of the wound and running from the nose. In general, if the disease manifests itself after the tenth day, counting from the date of inoculation, the results may be looked forward to with satisfaction; on the contrary, the sooner the disease shows itself the more danger will there be to the infected animal.

The accidents which oftenest occur are constipation, diarrhoea, retention of urine, with swelling of the belly, inflammation, and ulcers in the throat.

Out of 100 beasts inoculated with benign matter Detlof lost about ten. He further assures us that if the inoculated epizootic is communicated it still preserves its benign character, according to him; that it is sufficient to put the sound beast along with those that are inoculated, and to rub the nose of the former with the matter from the latter, to infect them with a benign disease. He adds, that the frequent inoculations performed in the Duchy of Mecklenburgh have not propagated the disease.

In these last experiments, out of 4,073 inoculated cattle, 438 died, 3,251 recovered, 290 were still sick when he wrote, and 106 did not take the disease.

Detlof thinks, as well as Camper, Munnicks, Vicq. d'Azyr, that beasts cured of the disease do not again contract it—at least very seldom. Such is the summary of the experiments made in this matter: they afford the following results:—

In the southern province, where the first experiments were made, in 1776, eleven-twelfths died.

The first trials made in Mecklenburgh, from 1765 to 1769, were very unfortunate; more than three-fourths died.

In the second trial, in the southern provinces, in 1777, a little more than a third died.

In 1763, at Brunswick, as in Holland, before that they inoculated the calves born of recovered cows, the one half were destroyed.

At Zwol a little more than a quarter perished.

In Mecklenburgh the result of a second trial was, that less than a third died.

In a third trial a little less than a fourth only died.

In Denmark, in 1770, 1771, 1772, a sixth perished.

The fourth trial in Mecklenburgh, was more successful, an eighth only dying.

Lastly, by following the Dutch plan, a twentieth only is lost.

Three orders of causes, which influence the success of the operation, can be established—

1st. Climate, season, and the constitution of the inoculated animal.

2nd. The length of time the epizootic has been in the country where the operation is performed.

3rd. The manner of performing it.

All observers agree that the epizootic is more fatal in countries where it prevails for the first time: it becomes milder as it progresses; and if efficacious measures are not taken to stop it, it will perpetuate itself, but, at the same time, it loses its intensity.

These variations in the disease, for example—whether it be new or old—explains why inoculation had such marked success in Holland, and some of the cantons of Germany, whilst it did not succeed in the southern provinces of France, where this disease had never before appeared. It will also explain why the last experiments made in some countries were more successful than the former.

The different plans of operation may be deduced to three principal—

The first is performed indiscriminately on horned cattle of different ages, and without making any choice of contagious matter. In the second, the contagious matter is taken from animals affected with a benign form, and care is taken not to inoculate cows in calf, or calves under six month old. The third is confined to calves born of recovered cows.

The first plan has not had sufficient success to be used advantageously.

The second plan had complete success in the hands of Claus Detlof, since, from the entire of the inoculated cattle, he only lost one-eighth; still, Camper found by experience that the intensity of the disease depended on the constitution of the animal, and to accessory circumstances, and never from the employment of virus from a beast severely affected.

The third kind of inoculation, that universally looked on as useful, is practised in Holland; but it does not succeed, neither ought it to be tried, except on calves born of cows cured of the disease, and, in consequence, cannot be made use of, except in a country where the disease has grown old, as in Holland and some parts of Germany.

Of these three plans of inoculation, the first is not proper under any circumstances; the second, the success of which is doubtful, can only be tried in a country where the epizootic, already old, has lost its intensity; the third can, perhaps, be only made use of in a province where the epizootic is sufficiently old to afford a sufficient number of calves born of cured cows.

The following consequences are necessarily deduced from these principles:—

It would be equally unreasonable as unfortunate to carry the germ of the destructive epizootic, under pretext of inoculation, into a country where it did not previously exist.

Any of the plans of inoculation cannot be made use of in a country recently infected.

These plans presuppose that the disease has made progress and spread widely for a long time; that no measure has been taken for its extirpation or radical destruction; they have also the disadvantage of continuing and propagating the contagion.

Where the epizootic may be old enough to have become benign in some places, inoculation, such as is practised in Mecklenburg, might be tried, taking care to determine the proportion of beasts dead of the disease naturally contracted, and those which perish after inoculation, which, as yet, has not been done.

If the epizootic shows itself a second time in a country formerly infected, the calves which would be born of cows cured of the disease in the former invasion might be inoculated.

If, by a very reprehensible negligence, the disease, left to itself, had so far rooted itself as not to be possibly destroyed, and if there were a sufficient number of calves born of cured cows, they could be inoculated as Camper recommends.

It would be much better to endeavour to destroy the epizootic in its commencement than to be under the necessity of having recourse to inoculation to diminish the dangers.

I will terminate these reflections, written in 1780, and which are not more novel than the discovery just made in Belgium, by explaining what the different nations have done to stop the progress of the disease.

In the Austrian Netherlands, (I am now speaking of 1780) and in Brabant, all the infected beasts are killed, and even those which are housed along with them, although they be still healthy in appearance, because experience has proved that cohabitation is sufficient to communicate the disease.

The English government did not act differently. The killing produced a like effect, the epizootic being thus destroyed. England being an island, may more surely defend itself against contagion.

Switzerland has followed the same plan.—Gazette Medicale de Paris.

#### WINCHESTER FARMERS' CLUB.

The last monthly meeting for the past year was held on Saturday, Dec. 18th, 1852, at the Black Swan Inn.

The subject for discussion on that occasion, introduced by the Chairman, Mr. Pile, was "The best means to be adopted to enable the tenant farmers to continue their avocations, and which would most conduce to the interests of the labouring classes, and of the community in general."

The CHAIRMAN said,—"Gentlemen, I have selected this subject for your consideration, now the country and the government have decided to continue a free-trade policy, and many members in the present House of Commons have been ungenerous enough to assert that the Act of 1846 was wise, just,

and good, which reduced the value of your produce 25 or 30 per cent., although they were fully aware that the occupiers of the soil had not been relieved from one iota of taxation, or from any local burdens. Such injustice has compelled many of our industrious farmers and best labourers to leave their native land for foreign climes; and I would remind our legislators, in the words of old Moore, that "mankind now see more and more that it is not ordained by the great Author of all things that any of them should for ever toil for the purpose of supporting the pride and selfishness of others." There is a woe pronounced against those "who lade men with burdens grievous to be borne, and yet they themselves touch not the burdens with one

of their fingers." Let even-handed justice be dealt out to all; then murmuring and discontent will cease.

"Ill fares the land, to hastening ills a prey,  
Where wealth accumulates and men decay;  
Princes and lords may flourish or may fade—  
A breath can make them, as a breath has made;  
But a bold peasantry, their country's pride,  
When once destroyed, can never be supplied."

Let us take a retrospective view, and endeavour to ascertain the cause of this treatment towards the occupiers of the soil. As far as I have been enabled to judge, from observation and past experience, it originated in by the tenant farmers adopting a more expensive and improved system of cultivation, without first ensuring security for their outlay. They did not perceive the trap laid for them, by the exhibitions of stock and agricultural implements, and the recommendations given them, at the annual dinners upon these occasions, to apply more skill and capital in cultivation. This advice they followed, and invested a large increase of capital in cultivation: now being entrapped, the government adopted free trade, knowing full well the farmers must submit, and would not give up their farms, with the liability of leaving their capital invested in the soil behind them, without payment. They held on, with the hope that protection would be restored, and being assured that they were in the same boat with the landlords, who still advised them to apply more skill and capital and energy to extricate themselves. This advice they also followed; which when ascertained, their supposed friends abandoned protection. They then discovered that their landlords had not been sailing in the same boat with them, and that the improved and more expensive system of cultivation which they had adopted secured their landlords' rents, and prevented any reduction; and if they demurred they were told that if they did not like it they may leave their farms, as there were others that would take them at the same rents. Of course there were—to obtain possession without payment of all improvements and unexhausted manure. And as it has been the endeavour to retain the farmers as yearly tenants, their votes are commanded by the landed proprietors; and as the principal part of the occupiers hold their land by this insecure tenure, it prevents their interests being fairly represented in parliament, which is most prejudicial to the whole class of occupiers, whether by lease, or cultivating their own land. Therefore it is not at all surprising, seeing that the occupiers are in this position, and liable to pay all charges levied upon the land, that they have been compelled to pay for the erection of new workhouses and gaols and rural police stations, and lunatic asylums, county bridges, &c., &c. Indeed, every possible ex-

pense has been charged to the poor's rate, and it has proved totally useless to petition for the redress of any grievance, as their requests are disregarded by parliament; and if a yearly tenant-farmer presumes to complain of county or parochial expenditure, or excess of game, he is considered a troublesome fellow, and soon got rid of at six months notice. Such injustice has ruined many industrious farmers, and within the last few years, many others from necessity, and many more from prudence, are abstracting their capital from the soil, which has been the means of lessening the produce and lessening employment; and the landlords will eventually find their land impoverished, and with all the present liabilities upon it, to a certainty. Such a system must prove injurious to the proprietor, the occupier, the labourer, and the community, and create an ill-feeling between landlord and tenant, and tenant and tenant, and tenant and labourer, and which I firmly believe it has done, and will continue to do, as long as the landlord has the power to possess the capital of the tenant invested in the soil, which prevents the employment of extra labourers, being apprehensive of being deprived of the outlay, or subject to increased rental. This system not being generally known amongst the labourers, they blame the farmers for not employing them—hence the ill-feeling; and the tenant obtaining the improvements, &c., of another tenant without payment, this also causes an ill-feeling—hence the disunion amongst the landed interest. The position of the yearly tenant-farmer is not an enviable one. He is governed by laws which he has not any voice in making, and compelled to pay all charges levied upon him, and not any control over the expenditure. He is permitted to occupy land on conditions and covenants, without being consulted, and obliged to pay for dilapidations, and liable at six months' notice to be deprived of his capital invested in the soil without payment, and compelled to seek refuge in foreign climes, and his family dispersed to the extremity of the world. I would ask a generous British public if they consider such an oppressed class deserves to be emancipated? and I feel confident, if it were universally known, the same indignation would be expressed in their behalf as there has of late against a system of slavery in a distant country. With regard to occupiers under a lease, they are generally prevented by covenants in cultivating the land to the best advantage, and at the end of the term the land is left impoverished. For a more full explanation, I must refer you to the observations made October 18, 1851, when general farm management was discussed by this Club: it was then proved that something more than leases was required to place the tenant-farmers in a safe position,



and this has since been confirmed by many eminent Scotch farmers, who have decided that they would prefer tenant-right to the longest lease without it. These men have been accustomed to 19 years' leases, and rents regulated by the average prices of corn. After occupying under such privileges, this decision is very valuable and convincing, and ought to be sufficient for the guidance of the occupiers in future, bearing in mind there is a law for dilapidations which has never been defined, leaving it to be proved that an injury has been sustained before the amount of damage can be recovered, and which proves the equity of there being a counter law for improvements, which does not require to be defined any more than the former; and if decided as usual, by arbitration, it would not promote litigation any more than the present law against injury; and if farmers were more particular in having the buildings and premises put in good repair when they first enter upon a farm, there would be very few cases of dilapidations. Those cases that are brought into court generally arise from the belief that if buildings and premises are left in as good repair at the end of the term as they were at the commencement, it is sufficient. This is quite erroneous, if they have engaged to keep and leave them in good tenable repair, as the law infers they were in such a state at the commencement; and if not, the tenant did not use due diligence. It would be well for them never to forget this, and act in accordance in their future contracts and agreements; and if farmers continue an improved system of cultivation under the old feudal tenure, as before described, they will never improve their condition; and if taxes, &c. are remitted, the amount will be added to their rents, or they may quit, and leave their outlay to benefit others. Therefore having taken this review, let us endeavour to ascertain if there is a possibility for the tenant farmers to successfully compete with the foreigner under a free trade policy, and to cultivate the land at a profit; and, judging from the discussions of this Club since its formation (January, 1850,) and the resolutions adopted at the present time, it is evident they cannot, without very great alterations in accordance with such resolutions. The most important is tenant-right, the want of which is the cause of all other grievances, which would very soon be remedied if tenant-right were universally adopted, to insure which there must be a legal enactment, which may be enforced without injury to any, as proved by the observations made and resolution passed by this Club, March 15th, 1851, and which you will find in the first half-yearly report of the second year; and as I then stated that agriculture, that is to say the land, must ever be the mainstay of the country. If you abandon the land, you abandon your inde-

pendence, upon which land the labourers claim a right to be employed, and from the produce of that land the community claim a right to be supplied with food. The equity of these claims cannot be denied; and it has been truly asserted by parties in high authority, and of different political sentiments, that the farmers must take example from the mercantile classes, and extricate themselves from their present difficulties, by a greater application of skill and capital and energy and increased productions; consequently, before they attempt this, they must adopt the mercantile principle in their undertakings, and commence their operations upon a solid and secure basis—security of tenure; and security for their outlay, with freedom of action, and equitable taxation, and local expenses. This appears to be the only resource left to the British farmers now the country and government have decided that the present free-trade policy shall be continued; therefore they must not again calculate upon the restoration of protection, but adapt themselves to public opinion, and place themselves in a position to derive benefit from the remission of taxes, or other relief which may be granted by the Legislature and, to the honour of the Earl of Derby and his Government, it is their intention to relieve the agriculturists and industrial classes by remission of taxes; and, to the honour of the present House of Commons, there is a majority that will support him, and who would not admit that the Act of 1846 was wise, just, and good; and I trust that the honourable and noble Earl of Derby will give further proof that he wishes well to the agriculturists by passing in the House of Lords Mr. Pusey's Tenant Right Bill, which has twice passed the House of Commons, only with this difference, by making it imperative—this would be the greatest boon ever conferred on the agriculturists—then carry out free trade fully, and abolish the law of settlement, and let the labourer have freedom to take his labour to the best market, and be relieved when requisite, where located, at the national expense; and also, the county and all local expenses, now charged to the poor rate, be defrayed by a rate upon property and income, and abolish all customs and excise, and adopt a system of direct instead of indirect taxation. Let the property of the country pay the expenses of the country; let the community bear their fair share of the privilege of being supplied with low-priced food, and property pay for its security;—and not be deterred in these proceedings by such observations as a free-trade member made recently in the House of Commons respecting the doubling of the house tax—that it would be a breach of faith towards those that had invested their capital in this description of property. Did the hon. member consider this with respect to farmers' property in 1846,

and at whose expense this free trade experiment has been tried? It is evident by this twaddle, that such Liberals wish to enjoy the benefits of cheap food without equitably sharing the expense. No, no; let us not have any class legislation, but equity to all; which is the intention of the present ministry. It is now time to come to the purport of our present subject, first observing that security of capital has reclaimed the fens and hogs in Lincolnshire, and converted it into productive land, and seeing the immense increase of produce in Norfolk by security of tenure; therefore, by the combination of both, it is impossible to conceive the consequent increase of food which would be produced, and the immense benefit that would accrue to the whole of the community; therefore, this must be the best means for the tenant farmers to adopt, in future, security of tenure with security for their outlay; this would induce them to fully develop the capabilities of the soil by availing themselves of all the recent improvements in cultivation, and the use of the best and most economical husbandry implements, and the aid of science to enable them to produce the largest amount of food at the least cost. Then farmers' clubs would be fully attended to acquire information as to the best mode of cultivation, and exhibitions of stock and implements would be resorted to for the selection of the best description of each, and then farmers may safely have their sons educated to fully understand geology and chemistry, to ascertain what is deficient in the soil, and to supply that deficiency by artificial manure, to produce the best crops at the least cost, and also to acquire a thorough knowledge of the management and treatment of live stock; and as knowledge and education are power, they will then have power to assert and vindicate their rights. This improved system of cultivation, if universally adopted, would require an increased number of labourers, which would ensure their full employment, and which labour would have to be performed by the piece, as there would not be sufficient labourers if employed by the day. Then two would earn what three now do, and they must be provided with good comfortable cottages and gardens near their work, or they would go elsewhere where such accommodations were provided. This system would improve the morality and ability of the labourer, as every man would be paid according to his merit, and not so much per week because he has arrived at the age of manhood; then the industrious labourer would be enabled to have a pig in his sty, and a side of bacon upon his rack, and a barrel of ale in his pantry; he would not then want to frequent those country pests, the beer houses; and this system would be the means of supplying the community with food at the lowest possible remunerative prices, evidently proving that

our interests are identical, and that this system would be the best means to be adopted to benefit each and all, and induce the industrial classes to remain in England to cultivate their native soil; and this system of security would be the means of bringing into cultivation all the waste lands capable of improvement. Then, if an extra ten millions of quarters of corn are required for the support of our population, the British farmers will use their best endeavours to produce it, and the productive powers of the land will annually increase to supply the wants of an increasing population, as there will not be any necessity of impoverishing the land every time the out-tenant quits; consequently covenants will not be required to prevent this injurious and selfish practice, but will substitute instead a more liberal and extensive view in the minds of the occupiers, and induce them to carry on their avocations for the benefit of the whole community. The necessity of some legislative enactment to secure the tenant farmer the benefit of his improvements, and the great national advantages that would accrue therefrom, has been so very ably explained by Mr. Henry Corbett, in his prize essay, published in 1848, that I would recommend all to peruse it, as he clearly proves the importance of such a measure in promoting a sincere good feeling, and in uniting the interest of landlord and tenant and labourer, and the immense benefit that would be conferred upon the community in general; therefore this is the system that ought to be universally adopted. It would confine every tenant farmer's occupation to his capital, and insure to the landlords men of capital to cultivate their land in the best possible manner, and insure the regular payment of rents, and ample employment for the industrial classes; then there would be a sincere good feeling existing between them; then landlord and tenant would be sailing in the same boat, the landlords at the helm, and the tenants and labourers working the vessel; and if they take on board all impediments to a thorough free trade, and freedom of conscience and action, and when fairly out at sea throw them overboard, I have no doubt, by the united exertions of each, they will be enabled to land at a safe haven, and do well enough, and be disposed to do their duty to their sovereign and their country, and defend its constitution, laws, and property. Such a bond of union subsisting among the landed interest would be most important and desirable, and which I should be delighted to witness, as I have not any wish, and I am sure I may say the same for my brother farmers, that they have not any wish to see our noble aristocracy and landed proprietors dispossessed of their property, and superseded by grasping cotton lords and selfish democrats, who have been the means of sacrificing so much of our

property, and never had the liberality to restore us a fraction, or grant us relief in any way; and I feel so confident of the integrity of our nobility and landed proprietors, that they would not knowingly sanction any act of oppression towards their tenantry; therefore I invite them to enquire into the present system of tenure, and then I feel assured they will perceive the equity of granting compensation to the tenant farmers for their improvements at the time of quitting, and appreciate the good results that would accrue thereby to the whole community; and I am satisfied they will not be actuated by any selfish motives, but will act in accordance with a high sense of honour and justice, and they will find that by doing as they would be done by is the best safeguard to property and station. Tenant-right, when established by law, will make the system universal; otherwise it will not be beneficial: then land will let at its real value, and not at the increased value by the tenant's improvements; and, in estimating rents, farmers must not in future calculate upon high prices for farm produce, and not be led away by the expectation that a large influx of gold will materially raise prices; the low rate of interest may assist them if loans are required to carry out their improvements, and which they will be enabled to obtain, having good security to offer, "capital invested in the soil." This they never had before, and this is the only system that I can discover that will give them freedom in every sense of the word, and without which they or any other class will never attain eminence in their avocations; and after they have obtained this freedom, they must still exert themselves to obtain equitable legislation, and for which purpose they must bring before Parliament such subjects as they consider prejudicial to their interests, in which they can be easily assisted by referring to the reports of this Club. The first subject discussed was a most important one—the taking of the corn averages, and I am surprised there has not been any attempt made since to obtain redress. We must all in future endeavour to act in accordance with the example and precept of the late noble Duke—each to do his duty in that station of life in which it has pleased God to call us. Having now stated my opinions as to the best means to be adopted under existing circumstances, and if I have erred I am open to conviction, and shall be willing to be corrected, I will now read the resolution for your consideration, to be sanctioned or amended as you think proper. Mr. Pile then read the following resolution:—

“Resolved,—That security of tenure, combined with security of outlay made for improvement at the time of quitting, would be one of the best means to be adopted to enable the tenant farmers to continue their avocations, and provide full employment

for the labouring classes, and by producing an ample supply of food for the community would prove beneficial to all.”

Mr. WILLIAM PAIN, after a pause, said, as no one seemed willing to rise, he would offer a few words on the subject. Certainly, after hearing the resolutions read, and what had fallen from the Chairman in his address, he was somewhat surprised and disappointed that he had not embodied some of those measures of importance to which he had alluded in his resolutions. The subject of tenant-right had been so often discussed in that room that all parties were perfectly conversant with it; and though it stood first in importance to the tenant farmer, because there was nothing which he stood more in need of, yet, as had been explained by the Chairman, landlords were not always in a proper position to grant it. It was well known that in this country a great deal of land was held under leasehold and copyhold tenure, where the holders had not the power to grant tenant-right. If they did, when they came to pay a renewal, they would be subject to a fresh valuation, and, from the improved condition of the land, obliged to pay a heavier fine than before. There was nothing which could give such a zest to agriculture as the establishment of tenant-right throughout the kingdom. It would provide greater employment for the labourer, and give increased production to the soil, thereby cheapening the principal articles of consumption, and conferring a benefit and blessing on the community at large. The Chairman, in his address, had touched on the law of settlement and on the poor rates. He thought that they were among the greatest grievances which the farmers had to complain of, and the labourers had still greater cause of complaint than they had. The farmers had hardly the means of assisting them, yet it was their duty to do everything that lay in their power to do so; but this great curse remained on their shoulders. Under the iniquitous law of settlement, a man who in his youthful days travelled from home, and laboured industriously, in his old age and hour of need was sent back to get relief from the parish in which he had passed his childhood, where he was uncared for and unknown. This should not be so; where the tree falls there let it lie. There should be but one parish throughout the kingdom, and anything short of such a change would make the remedy worse than the disease; because, where it was found a person was likely to become chargeable, he would be shifted from one parish to another till the poor man did not know where to lay his head. This was a strong illustration of the necessity of a national poor-rate being established by the Government. Land was, to all intents and purposes, paying a greater share to the county rates

and maintenance of the poor, than all other classes of the community. The farmers wished for no exclusive protection: all that they wanted was that those who had property in the country should pay for its protection in an equitable proportion. In his opinion the farmers could do a great deal for themselves, because the greatest benefits could be derived from their own exertions. Let them establish clubs throughout all the agricultural districts in England, and if this were done, they would be placed in a very different position from that in which they stood at the present time. The aristocracy had their political clubs—in fact, all denominations in the country had their clubs, from the manufacturing down to the labouring classes. Why then should farmers be different from all other portions of the community? If they had clubs, the next step should be to raise a fund to carry out their views; for it was well known that in England it was no use to have opinions unless you had something to back them. To give full effect to them, they must have funds. Let them then take an example from the Manchester men, and become free traders in the full sense of the word. He was the advocate of free intercourse with all nations—that was his political creed. The free traders had set the agriculturists an example which they ought to follow, and by doing so they would do more for themselves than either the landlords or Parliament had done for them. Let them, therefore, he would say, unite as one man, and form a league, which would give them the opportunity of returning members to Parliament who would exert themselves to carry out their ideas. With a good fund he thought they would be able to take that position in society which they ought to have held years ago.

Mr. WALTON was delighted to find that the Club had acquired a character for respectability, and he believed it almost stood alone, in not having political subjects excluded from its meetings. He was pleased to hear from the Chairman that no wish was entertained to dispossess the aristocracy of their property; but must express his sorrow at what had fallen from him in relation to that important body, the manufacturers—that they were disposed to take away the benefits which would accrue from good cultivation. This he denied altogether. The present Government six years ago sowed the seed, as Sir James Graham said, and the effects now produced shewed that they had not acted wrong in doing away with that monopoly which the land alone enjoyed. He never gained any protection from what was called protection. After some encomium passed on the Earl of Derby, Mr. Cayley declared that the noble lord, notwithstanding his professions, never meant protection, he only meant place. The agriculturists were not desirous of advancing at the

expense of other classes, and all monopoly would be useless to them, and only beneficial to the agricultural landlords, clergy, and others who benefited by the receipt of high rents. He was glad to hear the Secretary say the farmers should look to themselves, and not to others; it seemed as if they now found out that the Manchester school had not injured them. He was of opinion that if his brother farmers had taken up the subject five years ago they would have obtained a re-adjustment, and would have had tenant right—in fact all that they chose to ask within reason. With the increase of population, the increase of cultivation, the increase of trade, the increase of commerce, the increase of gold, and the increase of everything which constituted the prosperity of this island, it was ridiculous to say that one interest could ride rough-shod, and overpower at the expense of another. As to tenant-right he had long been an advocate of it, and to ensure it the best way was to make a good bargain at first. Twenty-six years ago he had spoken of it in Romford Market, and stated that he found every interest in England had protected itself, and all classes but farmers had done so. He then recommended them to follow the example; but why had it not been done? Because the tenant farmers did not think themselves, but allowed themselves to be led by the stewards. Now they were told that they were an important body, why did they not act as such? He concurred with Drummond, that property has its duties as well as its privileges. There were few parishes in England, which he knew, that produced a more ample quantity of corn and mutton than in Hampshire. With improved implements and artificial manure no doubt this could be considerably increased; but it was improbable that this would be done if the landlord did not enable his tenant to bring forward these improvements. Political influence had been the bane of agriculture. Look at half the places in that county—Medstead, Wield, and up to Farnham, let them look at the state of the pigsties and outbuildings on lands which obtained the extreme rents which war gave to them, and the increased improvements in the cultivation were the reason why the landlords obtained the same rents now. With regard to what had been suggested relative to raising a fund among the farmers, it would require only one per cent. on their rental, which in two years would produce two millions—they would then be “a great fact.” Till they did that they must not entertain the idea of protection, but must depend upon their own energies as the means to benefit their condition and that of the community generally. The only true mode of keeping a tenant farmer was to give him security for any improvements that he might make. The farmers did not ask for protection, for they had it in

their power at that moment to cultivate better than they did if they had that support from their landlords which they ought to demand. Look to the tenantry of Lord Yarborough and Mr. Coke, now Lord Leicester—how was it that they were in a prosperous state? It was because they had security for their improvements. These noblemen never had to pay one farthing for compensation, because, in the event of any one quitting, there were forty people ready to come forward and pay the outgoing tenant any sum which he might require. He had known the owners of many farms, who, in consequence of political coercion, had lost nearly a third of their rental. Serve the political dogs right! He concluded by stating that throughout his life he had been desirous to benefit his brother farmers, and would as long as he was able give them his support.

MR. SPOONER said it appeared to him that, in discussing the subject brought before them that evening, the resolution should agree as closely as possible with the terms of the notice paper; but it appeared to give a very prominent place to the labouring classes; therefore if they passed that resolution they would not do justice to those which preceded it. He thought that the subject to which Mr. Pain had alluded ought to form a prominent feature in the resolution, for a greater boon could not be conferred than the establishment of a national poor rate, and the abolition of the law of settlement, which latter would be nothing but consistent with the unerring principle, that a labourer should have the power to take his capital to any town or to any place he may think proper. Nothing, in his opinion, would tend more to the improvement of agriculture than this; for it was well known that labourers were frequently obliged to walk sometimes two or three miles from their residence to their place of employment, and return home the same evening; the consequence was, that a man's strength was half exhausted, and he could not do justice to his master, and became somewhat discontented with his lot and condition, and little inclined to advance the interest of his employer. In such cases landlords ought to see that cottages were erected on their farms, in order to encourage the men as much as possible to become skilful labourers. Many ricks at times were spoiled because there were not men on the farm who could thatch, and property to a vast extent was in consequence destroyed. With regard to the abolition of the malt duties he thought it would materially conduce to the benefit of the labourers and the farmers. He had heard it asserted seriously, that the remission of two millions and a half of the malt duty would not do any good. To this he would reply, then put on two millions and a half more. He was very sorry to find that the mo-

tion had been thrown out; for he did not think that there was any sensible man who could not see that the whole must ultimately be swept away. He was sorry to find that some of those who were lauded so much as the friends of the labouring classes, on a recent occasion had not exhibited their love for those whom they professed to serve, when it was proposed to take off this two millions and a half, and helped to overthrow the Ministry on that question. In allusion to the observation which had been made that the agriculturists had lost time in not agitating various subjects connected with their avocation, he trusted the time would never come when men would be prevented from advocating the cause which they believed to be right, for nothing but evil might arise from such a dereliction of principle. When Lord John Russell was for five or six years in the House of Commons, and had a majority there, what single measure did he bring forward to benefit agriculture or counteract the principles of free trade? The noble lord had then the finest opportunity of being the most popular minister that ever existed. It ought to have been his endeavour to disarm agitation by doing equal justice to all parties, but not one single measure had been advanced in favour of agriculture even at the time when they put it into the Queen's mouth to say that agricultural distress prevailed.

MR. W. SPEARING concurred in the resolution, and perfectly agreed in the justice of tenant right, and security for unexhausted improvements; but before they obtained this by legal enactment, they must see larger assemblies of farmers, and he wished among the hundred members of which the Club was composed that the attendance at the monthly meetings was more numerous. It was only by union among themselves that these objects could be achieved. If they showed apathy, it was their own fault that they did not succeed. When he saw that a great and important subject was to come under discussion that night, he wished that the attendance had been more numerous, and that men more capable than himself had come forward to express their opinions. He agreed with Mr. Pile on the necessity for the abolition of the law of settlement, which was baneful to the labourer, who ought to sell his labour at the best market. There was a class of men which deterred the tenant farmer from cultivating a good friendly understanding with his landlord, and thereby did great injury. If they wanted a farm, he would recommend them to take it from the landlord, and not from the middle man, the steward, who probably understood little or nothing about the quality or value of land. He believed farmers' clubs to be the best means through which farmers could obtain advantages that would enable them to carry on their avocation more satis-

factorily. He believed that a national poor-rate would be generally advantageous; and if all property was assessed alike, on the basis of the income-tax, it would be a great relief to the tenant farmer. Under present circumstances they must rely more on their own resources, and have more freedom allowed to them for the purpose of exercising their judgment, which many occupiers of land were prevented from doing, in consequence of being bound down by prejudicial covenants.

Mr. T. S. GODWIN thanked Mr. Pile for the able way in which he had brought the subject forward on that evening, and generally for the manner in which he conducted the proceedings. Their first consideration must be the situation in which they were placed. As tenant-farmers they were mere nonentities; and he quite agreed in Mr. Pain's suggestion, when he looked about and saw their situations, that they had only themselves to blame, and thought if they connected themselves, and formed a bond of union, all the difficulties of their position would vanish, and unless this were done, it would be in vain to talk of tenant-right. With respect to what had been alluded to by Mr. Spooner relative to the subject of discussion in the House of Commons, it could not be beneficial either to the farmer or the labourer, and had not been asked for. Many men had said that it was very easy to calculate the advantage to be derived, and that it was their own fault they did not obtain it. They should plainly tell the legislature that the only way to obtain it was to agitate. They were told that the price of barley would be increased by the abolition of the malt tax; be this as it might, he would say the greater amount it produced the greater reason for its remission. He quite agreed with Mr. Pain in his suggestion of the necessity of an alteration in the law of settlement; but the time was coming when they would very soon find that this law would not be in their way. He also concurred in the second suggestion, as to the expediency of farmers forming themselves into clubs throughout the country, as the best means of having their interests well attended to.

Mr. W. Pain having read the resolution proposed by the Chairman at the close of his address, said so far as the resolution went, no one, he believed, would dissent from it. He had before delivered his sentiments; he would, therefore, if the Chairman would allow him, take the sense of the meeting on an addition which he wished to embody, to stand as follows:--

2. That the Legislature may relieve the agriculturists, and more especially the labouring classes, by abolishing the law of settlement and the establishment of a national poor-rate, as well as by the total remission of the malt and hop taxes.

3. That the agriculturists may benefit themselves

by the establishment of Clubs throughout the country, and raising a fund to be applied in furtherance of their mutual interests.

Mr. KEARSEY said, in his humble opinion, a great deal of credit was due to the Chairman, for the very able manner in which he had brought the subject forward. He fully concurred in the recommendation to petition the legislature to abolish the period of six months' notice for a tenant to leave and to extend it to two years. The effect of this alteration would be to do away, in a great measure, the grievance now complained of, because the tenant would have time to prepare for quitting, if he should wish to do so.

The CHAIRMAN was pleased with the observations which he had heard on that evening, because they all bore out what he had previously affirmed. He would assert that it was far from his wish to commit an act of injustice towards any class of men, and he believed if the legislature would place the landed proprietor in a right position, he would be enabled to grant his tenants compensation for improvements at the time of quitting. With regard to Mr. Kearsley's proposition for a two years' notice, it was something in accordance with Mr. Pusey's bill. If the system of tenant-right were fairly adopted, it would enable the tenant to be properly represented in the House of Commons. The great Lord Chatham had said that "taxation without representation is tyranny." It was high time for the farmers, now that they were thrown on their own resources, to exert themselves, and endeavour to place themselves in the same position as the mercantile classes. With regard to what Mr. Godwin had said, that they had not agitated for the repeal of the malt tax, he would remind him that a petition for that purpose was got up in that room, presented to the House of Commons, and thrown under the table without further notice. Farmers had, in consequence, become tired of petitioning, and the legislature knew that the tenant-farmers had no power, and that was the reason why they were so treated. The tenant-farmers of England would be able to obtain tenant-right, when they could vote conscientiously and independently; then they would be able to return every county member in England. The legislature would then reason in this way—"If we do not do justice to the tenant-farmers they will oust every county member;" but as they were now, they must submit. Under this state of things it was impossible a tenant-farmer could join a club—he dared not to do so, because he would be liable to be turned out of his farm in six months. Was it possible, he would ask, for any class of men to be in a more servile position? He wished to see them emancipated, but this could not be done unless they commenced operations on the basis of tenant-right, and were

guarded against being misled in carrying out expensive cultivation without security, which was a cause from the effects of which they were suffering. Let them look back since the act of 1846, and see if any measure had been brought forward in Parliament to relieve agriculture from one iota of the burthens under which it had long laboured; on the contrary, every possible expense that could be devised had been charged on the poor rates. This

was the way in which the tenant-farmers had been treated, and the system was likely to continue, till they could vote according to the dictates of their conscience. What the farmer wanted was freedom to apply his capital and skill to the best advantage, and freedom of conscience, to get themselves represented in the legislature. Mr. Pile then read the resolutions as amended, which were put, and carried unanimously. — Hampshire Chronicle.

### CHEESE MAKING FROM A SMALL DAIRY.

We have received requests from several of our lady correspondents, to write a short article on cheese-making, especially in reference to that large class of farmers who keep but few cows. It always gives us pleasure to comply with the requests of the ladies, especially of those who are good housekeepers—know how to milk a cow, make good butter and cheese, and cultivate a small flower-garden.

First-rate cheese can be made from a few cows, but it is attended with more labour in proportion to the amount made, than in a large dairy, inasmuch as the curd has to be made every morning and placed aside till you have sufficient to make a good-sized cheese. The milk is placed in a tub, and warmed to the proper temperature (95 deg. Fahr., or about as warm as when taken from the cow), by adding a portion of heated milk. The rennet is then added, the milk well stirred, and afterwards let alone till the curd is well come. The time this occupies varies from fifteen minutes to two hours, according to the amount of rennet, the temperature, &c.—the hotter it is put together, and the more rennet there is added, the quicker will the cheese come. As a general thing, the longer it is in coming, the tenderer and sweeter will be the curd. If it comes too quickly, it is owing to an excess of lactic acid being formed from the sugar of milk; so that the curd has that hard, tough, white appearance, that is the case when the curd is precipitated by vinegar, or any other acid; but, if there is a very slow formation of lactic acid, the curd is gradually precipitated in flocks, is less dense, and very sweet and tender. It is then broken up quite fine, either by hand or a curd-breaker made for the purpose, which cuts it into very small pieces. After this it is allowed to stand and settle. The whey is then drawn off and

passed through a sieve, to remove any curd there may be in it. The curd is then placed in a strong cloth, and well pressed, to remove the whey. It is then placed in a cold place, and the operation repeated daily—or every other day, if the milk will keep sweet, as it will in the fall—till there is curd enough to make a cheese of the desired size. When the right quantity is obtained, the curd is all broken up very fine, salted and well-mixed. In putting the curd in the vat to be pressed, a cloth sufficiently large to cover the whole cheese is placed in the vat, and into this cloth the curd is put. When the curd has filled the vat, a “fillet” (usually made of sheet tin, and from three to six inches wide, and sufficiently long to lap over four or five inches when placed round the cheese) is placed inside the vat for an inch or so, and the cloth drawn up straight, so that when being pressed the fillet will not cut it. The whole of the curd is then put in, the cloth turned over the top of it, a smooth board placed over this, and then it is ready to press. After it has been pressed for some time, it is taken from under, and punctured all over with a skewer, either of wood or iron. Place it in the press again, until it has become sufficiently consolidated to take out of the vat without falling to pieces. It must then be turned, or inverted in the vat, and a clean cloth put round it. Place it again under the press, occasionally turning it and putting round it fresh cloths, till the cheese when pressed does not wet them. It is then all right, and should be kept in the dairy, or other cool, damp place, for a few days, placing a little salt round it, when it may be taken to an upper room, where it will require turning very frequently, or the side next the floor will mould. Let the room be dark and well-ventilated.—Western Agriculturist.

## EAST OF BERWICKSHIRE FARMERS' CLUB.

This Society held an adjourned monthly meeting in the Townhall, Dunse, on Tuesday, the 4th January last, for the purpose of taking into consideration the report upon the farming system pursued at Enterkine, Myremill, &c., which was presented to the last half-yearly meeting by David Milne Home, Esq., of Wedderburn.

Captain LOGAN HOME took the chair.

The Secretary having read the minutes of last meeting, the Club resumed consideration of

## THE SYSTEM OF LIQUID MANURING,

by the reading of reports which had been handed in by different members. The first was—

## FROM MR. CALDER, FAIRNEYSIDE.

About 25 years ago I experimented with liquid manure, the produce of cattle and pigs fed at Gungreen distillery, conveyed in a water barrel about one-third of a mile and applied to new grass, the crop of which was much benefited by so doing; but finding little or no advantage to the succeeding crop of oats, and as it would not pay the expense, I gave up using it. No doubt liquid manure applied by machinery would cost but a trifle compared with the expense it cost me; but it becomes a most important question, will it even then pay, on a farm of 300 or 400 acres, under a regular rotation of green and white crops? On such, there should be an abundance of straw, to absorb the whole urine produced from both cattle and sheep, provided the boxes, sheds and pens they are fed in are nearly all covered, and the rain water from the principal buildings conveyed away by spouts and not allowed to fall into said feeding apartments. The manure made entirely from the droppings of all kinds of stock, is quite superior to that where the rain is allowed to fall on; and a question occurs, why irrigate with liquid manure produced on the farm at all, at such heavy expense, when it can be all absorbed by the straw? Guano and other foreign manure can be applied by the hand for a mere trifle per acre, to such crops that may be considered would be benefited by the same. Some years, when there is an average of heat and rain, the grain crops in the rotation often get too rank, and are injured by either the application of guano or liquid manure. The straw when converted into dung is to drive to the various fields at any rate, and there is no more expense doing so, when so converted by the droppings of stock, than when partially mixed with rain water. The ordinary horses kept on the farm drive the manure to the fields, often when they have nothing

else to do. On a farm all under grass or other green crops, where there is no straw produced, liquid manuring would certainly pay better, particularly as large crops can be produced without injuring them. Where a farm-steading is situated on a height, the liquid manure requires no pumping, as it would distribute itself by gravitation where required; but it becomes a subject for calculation whether the expense of leading the crops up to the steading, or forcing up the liquid manure where the steading is situated low, is the most expensive.

Of the four farms visited by Mr. Milne Home, three are farmed by the proprietors, and Myremill tenanted by Mr. Kennedy; but it is not said how he is supported by his landlord—whether he pays interest on the cost of any of the erections, or receives them all gratis. The piping and other requisite erections would all require to be made by the proprietors, as I fear no tenant would ever attempt to make them.

With regard to stall-feeding of sheep (or rather stall-fattening; as all stock should go direct from the pens to the butcher), I am of opinion it might be profitably carried on, where there are clay land farms. A number of tenants would likely very soon try it, had they stalls or pens erected to enable them to do so. Where such farms have been thoroughly drained, there are now ten acres of turnips grown for one formerly, but the nature of such soil prevents them from being profitably consumed in damp weather. As already noticed, far less straw is required under the covered shed feeding system of cattle, so that there will be plenty for supplying litter to the sheep in pens. The expense of boards would be saved, as they are apt to injure the feet of the sheep and colour of the wool. Chaff or burnt clay, as stated in a letter from Mr. Dickson, of Peelwall, some time ago read to the Club, might be put in the bottom of the pens to absorb the urine, and afterwards littered with straw when necessary. I have for a number of years fed a few early lambs under cover littered with straw, and found the ewes and their lambs thrive well. I calculate the expense of carting the turnips to the pens more than counterbalanced in the saving of turnips, the sheep feeding faster, and a more weighty fleece. Upon good turnip farms stall-feeding of sheep is not likely to be much practised, as it is absolutely necessary, where there is light land and little depth of soil, to consume a great proportion of the turnips on the land when grown for the benefit of the following crops.



It would be satisfactory if Mr. Kennedy would follow the example of Mr. Mechi, and favour the public with his balance sheet, for the guidance of both landlords and tenants in adopting the system practised by him at Myrcmill.

Will not a great part of the liquid manure escape by the drains, particularly in winter during a long course of wet weather, as no more can be stored than the tanks hold?

Before concluding, I take the liberty to observe that Mr. M. Home deserves the special thanks of the Club for introducing into his leases the compensation clause, viz., "For any lime, bonedust, or other article procured by the tenant extra of the farm itself, the full benefit of which shall not be exhausted before the legal termination of said lease," the outgoing tenant is to be paid for, which will be of great advantage to him, as well as a gain to the landlord. In Ireland the noise made about tenant-right applied also to buildings, as well as the above; I hope, therefore, Mr. M. Home will also show the noble example of including compensation for all necessary substantial buildings made by the tenant, when the landlord is not inclined to make them—not to exceed say one half-year's rent. Some such clause is much wanted, as the most of farm-steadings are too small for the improved system of feeding cattle in covered boxes.

From various causes a number of tenants cannot get any additional buildings made to them even when they agree to pay interest on the outlay; but such a clause in the lease would be a great boon, as they could then make the necessary buildings themselves.

FROM MR. HARDIE, REDHALL.

There is no means of ascertaining of what value the liquid manure is as applied to these farms, as the whole is mixed with guano or some other fertilising substance. It is worth while to enquire when Mr. Bell's summer begins and ends, as in this county, put on grass what you will, it will not cut in most springs till towards the end of May; and every one knows how the qualities of grasses fail of nourishing properties as the year advances. First cutting say May, to cut Mr. Bell's 6 cuttings will then reach to October. I should think his last cuttings would give but a small return of butter and cheese. It is well known that cows fed on cut grass give less of both, and of an inferior description, than when pastured on the fields. It is also clear that the land must have been very poor pasture when it required two acres for one cow, as two acres of good pasture should suffice for two cows, and two cows so pastured would give a quantity equal to three cows if fed only on grass in the house, and superior in quality. It is therefore difficult to see how Mr. Bell could have a gain of 6

or 7 pounds per acre. As regards Mr. Kennedy's crops, they are truly magnificent as a whole. The oats for example—10 qrs. per acre. I cannot conceive how such a crop did not lodge and rot, as in Ayrshire and the west of Scotland the land grows a large quantity of straw for the quantity of grain produced, and far more rain falls there than in this county. I know where this season oats are producing not many more bolls than he has quarters. They went so early down that the weight per bushel is only 37 and 38lbs. Mr. Kennedy's mode of feeding in the straw yards, &c., &c., is I think very important, and I would say profitable: where there is the fact that in Mr. Milne Home's calculations on this head no deduction is made from the sum of £103 10s., for the interest on capital necessary to be sunk for the making of sheep pens, &c., I think it will be found that the sum here stated will utterly pass away. I had intended to say something as to this system requiring, for its being carried on, what cannot by any means be at all times and places attained, viz., a competent supply of water; I had intended to remark, also, that even though the system here reviewed had done well when practised by one or two parties, it would not therefore necessarily succeed as a universal practice, as such a practice would tend at once to raise the price of things bought, and to lower the price of things sold, and so would tend to reduce the profit; and to notice also that the results quoted, as arising from a given amount of liquid manure, occur in the case of a farm which has now been for a considerable time in a state of very high cultivation. But on these I cannot dwell. I am already thoroughly ashamed of the length of my observations, which assuredly I had no idea of when I began. It only remains, that I say in conclusion, that though my remarks may seem as altogether directed *against* the system of liquid manuring, I should be sorry to be thought of opinion that it has nothing to recommend it. That there may, and that there are good things connected with it, I am very willing to admit. But that as a whole it is to be substituted for the present mode of culture, I am as yet utterly unable to see. I have stated my reasons for this opinion fully and frankly, and though I am unable to come to Mr. M. Home's conclusions on this subject, I am not on that account the less able to thank him cordially for bringing this subject before the notice of the Club.

FROM MR. NISBET, RUMBLETON.

With the exception of one palpable error in figures, in the comparison of liquid manure and soiling with that of pasturage, on Mr. Bell's farm, I will not take up the time of the meeting with calculations, but leave that to more able hands. In the case alluded to, it is stated that 16 cwt. of

guano per acre is used along with the liquid. Now as the comparison is made upon two acres, there ought to have been 32 cwt. charged, which would have stood thus:—

32 cwt. guano .....	£15 4
Cutting grass for cows.....	13 10
Interest on capital.....	4 0
	32 14
Produce of 10 cows.....	40 0
	7 6
Produce of one cow.....	4 0
	2)3 6

Difference in favour of soiling £1 13

per acre, instead of £5 9s. as shown by the report. I may here state that I think there is a very low estimate taken of the productiveness of two Scotch acres, sown out in the ordinary way with rye grass and clover, when they are said only to keep one cow.

As regards Myremill, the produce of all kinds, according to the report, is very great. I had the pleasure of visiting that farm in June 1850, along with two friends, when we received the greatest kindness from Mr. Kennedy. We were much pleased with the fine crops of Italian rye grass, as also the very superior accommodation for the cattle—the byers being well ventilated, and kept very clean by flushing the gutters. The green crops were at that stage in which we could not judge of their excellence; we were, however, disappointed in the white crops, which, in our opinion, looked very indifferent—the oats, certainly, not at all like 10 qrs. per acre.

I doubt whether the system of drawing the turnips from the land, for the purpose of feeding sheep in pens, is advisable. I am of opinion that the treading of the sheep upon the land, whenever it is dry, is of great benefit to the succeeding crop. Neither do I approve of converting the solid into liquid manure. In viewing Mr. M. Home's report, as a whole, it occurs to me that until a satisfactory balance sheet be published upon liquid manure, it would be hazardous for any tenant, even with the assistance of his landlord, to embark in the undertaking. I am however of opinion that the soiling of cattle may be practised on all arable farms, to more or less extent, with profit; and I am satisfied that Italian rye grass for that purpose is superior to any other. I have tried it,—to a very limited extent certainly,—for the last two years, and have every reason to be satisfied with the result. I shall give my experience of last season. I sowed out in the first week of April last three imperial acres with Italian rye grass at the rate of 4 bushels per acre; manured when sown with 1½ cwt. of Shark's Bay

guano, and 1½ cwt. of gypsum, at a cost of 12s. 6d. per acre. I commenced to cut the grass on the 29th June, which kept the following stock for three months, viz., 11 calves, averaging three months old when put on to grass, 2 horses, a bull, and a number of pigs; the calves got 1½ lb. of linseed cake per day along with the grass. There were two cuttings, and I gave 4 tons of liquid manure from my tank after the first cutting, put on every two or three days, as the first crop was cut, put on with a barrel on wheels. I am aware that this is very inferior, in comparison with those farms alluded to in Mr. M. Home's report; still, considering the inferior quality of the land, and the very moderate charge for manure, I am very well satisfied with the result. I may mention that I had carrots on the land the previous season, which is three feet deep of moss, and was treated as follows—10 tons of farm-yard manure were ploughed in, with a furrow 18 inches deep, in January 1851, the carrots being sown in the end of April following, with one cwt. guano per acre. They were a very inferior crop, having suffered very much from a high wind, shortly after brairding. The only other manure given was the tops of the carrots, which were ploughed in after the crop was taken up. I think that were farm-steadings properly spouted, so as to carry off all rain water, but that which falls in the open courts, the liquid could be nearly all absorbed in the solid manure. A tank would still be of advantage to collect any overplus which might occur, in such a season as the present, which might be used on grass; or by having a covered dung-pit, it might be advantageously used upon road-scrappings, or other vegetable matter which might be collected during summer.

FROM MR. GIBSON, FOULDEN WEST MAINS.

I cannot refrain from saying that I enter upon this subject with unfeigned diffidence,—and with such an amount of reluctance as nothing but the expressed wish of the Committee of this Club that I should give my views, and the feeling that Mr. Milne Home is entitled to them such as they are,—could have overcome. Any remarks that follow shall be in reference to the two farms of Enterkine and Myremill, as it appears to me that Mr. Milne Home's remarks on these, furnish the gist of the question at present before us, which is generally—“What is the relative advantage of liquid manuring over the mode of manuring at present in general use?” And first, in reference to Enterkine.—The statement is made that while in ordinary rye grass and clover 2 Scotch acres are required to keep one cow for summer and autumn, 2 acres of Italian rye-grass, cut and manured 6 times, will keep 10 cows. The produce of each cow is held as £4; and the account bears that by the present system two acres

are worth £4,—by the other they are worth £40. From this there are to be deducted, however, the following expenses, viz. :—

1. Cost of 16 cwt. of guano.....	£7	12	0
2. Cutting grass for 10 cows daily at 1s. 6d.....	13	10	0
3. Interest on capital at 7½ per cent....	4	0	0
<hr/>			
Expenses of 2 acres.....	25	2	0
Produce as above, .....	40	0	0
<hr/>			
Profit on the two acres, .....	£14	18	0

Being a return of £7 9s. per acre instead of £2, or a clear surplus profit of £5 9s. per acre. Now I would have it distinctly borne in mind that the real question for our consideration is,—what is the advantage of this liquid manuring? This being the case, it humbly appears to me that the foregoing mode of calculation is not exactly the correct mode. To estimate the real state of matters let us take the field in question, not as pastured in the one case and cut in the other. Let us take it as cut in both cases,—in the one case *without* the application of liquid manure, and in the other *with* that application. Now, if I understand Mr. Milne Home aright, he states that by “raising ordinary rye grass and clover 16 tons per acre are got.” Let us apply this to the foregoing calculation. If 80 tons of grass feed 10 cows, then 32 tons will feed 4 cows. Now let us repeat the above calculation with the change hereby made necessary,—

1. Cost of 16 cwt. of guano.....	£7	12	0
2. Cutting grass for 10 cows at 1s. 6d. a day.....	13	10	0
3. Interest on capital at 7½ per cent....	4	0	0
<hr/>			
Expenses on two acres,....	25	2	0
Produce as above,.....	40	0	0
<hr/>			
Profit on 2 acres,.....	£14	18	0

Now that is Mr. Bell's return for 2 acres. By my calculations above, 2 acres cut (and observe this is in identically the same proportion) keep 4 cows, which at £4 each makes £16 for the two acres. Now state the account thus :—

Produce of 4 cows,.....	£16	0	0
Deduct expense of cutting grass for 4 cows daily at 1s. 6d.,.....	5	8	0
<hr/>			
Profit on 2 acres,.....	10	12	0
Mr. Bell's profit is.....	14	18	0
<hr/>			
On 2 acres,.....	£4	6	0

or on one acre £2 3s. instead of £5 9s., according to Mr. Milne Home's calculation. But farther, it is not stated what is the expense incurred by Mr. Bell in preparing his land for his rye grass crop. If he, like Mr. Kennedy of Myremill, ploughs it and dungs it in the previous autumn, then I apprehend that the expense of this, together with the value of the urine

from 5 cows (in all 2250 gallons *unadulterated*) which of course, is lost to all the rest of the farm, will very much more than counterbalance the profit of £2 3s. per acre as brought out above. Before leaving this point, I would just observe in passing, that there seems some discrepancy between Mr. Milne Home's statement that about 16 cwt. of guano per acre were applied by Mr. Bell, and the sum of £7 12s. stated as the price of guano for 2 acres. It is of course plain that if 16 cwt. were applied, the sum stated should have been twice £7 12s., which would render the loss ruinous,—independent altogether of the deductions I have made above. This, however, I presume is a mistake, and that only 8 cwt. per acre were applied. We come now to consider Myremill, and to estimate the profits which Mr. Milne Home calculates to flow from the system of liquid manuring on that farm, and these I cannot help considering more apparent than real, as I will endeavour to show as shortly as possible. And to begin with the Italian ryegrass. Mr. Milne Holme states the surplus produce, above the amount to be obtained by ordinary culture, as 24 tons per acre, which at 10s. per ton, makes £12 per acre, (it is stated £13, I presume by a misprint.) From this, however, he deducts £2 7s. 6d. for manuring, cutting, and carting home, &c., these 24 tons. The sum of 10s. stated for the cutting and carting home I should imagine too little. But I will pass that over, and proceed to the essentials of the calculation. And to throw light on this point I would request you to look back for one moment on what has been said in reference to Enterkine. We have seen there that after leaving out of view the expense of the 2250 gallons of unadulterated urine, &c., the profit per acre was only £2 3s. Now observe the produce of both places is stated as much the same, being about 40 tons per acre. Now to obtain this, Mr. Bell had to lay out a sum of £3 16s. per acre in guano; and though Mr. Kennedy perhaps does not need to do this on account of his oxen giving more urine than Mr. Bell's cows (I say “perhaps,” because it is not expressly stated that Mr. Kennedy does *not* use guano, though I infer this from Mr. Milne Home's remarks) yet it is obvious that this is a matter of no consequence whatever. It is plain that if he did not use guano he used what was as valuable as guano, and what produced as good a result, viz. 40 tons of grass per acre. If this mode of reasoning be just (and you observe that here there is just so much of the valuable liquid lost to the rest of the farm) then it follows that my conclusion and Mr. Milne Holme's will be very different indeed, and instead of £10 12s. 6d. per acre brought out by him as the clear surplus profit per acre, I see not how the profit can be estimated at more than was found in the case of Enterkine, viz., £2 3s. or thereabout, for the produce of both places

being much alike, and the means of obtaining it substantially the same, that conclusion seems inevitable. We have then, I apprehend, to state £2 3s. or thereabout as the surplus profit per acre of ryegrass on Myremill. But farther, from this sum will fall to be deducted the expense of ploughing and manuring the land in the autumn, which Mr. Kennedy does for his ryegrass crop,—besides the interest on the extra capital required for this system of liquid manuring—and I think I am not mistaken when I suppose that these united will more than eat up the sum of £2 3s., the remainder of the surplus. If the foregoing reasoning is just I may be excused from going at length into the consideration of the root crops, and may be allowed to say, that if the irrigation system will not pay in regard to the rye-grass crop, which is made chiefly to depend upon it, it will not succeed better in regard to the root crops, which only partially depend upon it. I would just remark, in one word, that what appears to me a fundamental and vital error in the calculations reviewed is the taking for granted that the liquid manure is all lost by the present system. Now this need not be the case, and in point of fact is not the case. Its valuable properties go to enrich the general farm. We pass now to the consideration of the expense of transporting manure to the Italian rye grass field, and here Mr. Milne Home brings out the large sum of £160 19s. as saved on 87 acres by the irrigation system. Now, if I have succeeded in showing (which I think I have) that that system will not pay as applied to rye grass, it seems unnecessary to go into the relative cheapness of transport of the two systems. I cheerfully assent to Mr. Milne Home's calculations as to this; but for the above reason I cannot consent to this sum of £160 19s. being put down as profit. Mr. Milne Home brings out the sum of £35 as by the irrigation system saved on the expense of transporting manure to the green crops. Now this may very possibly be correct in one sense. But even this gain is more apparent than real; for, on the other hand, it must not be forgotten that the carting out of the manure is very generally done at a time when, by reason of frost, or as of late, by excess of rain, the horses cannot be employed at any other work.

We now come to consider the system of feeding sheep under cover, and here Mr. Milne Home states two items of profit, viz. :—

From manure saved from 460 sheep	£57	10	0
From extra wool	...	...	46 0 0

In all, ... .. £103 10 0

Now, without in the smallest degree impugning the correctness of this estimate, I cannot help remarking that there are grave drawbacks from it. At some of these I will merely glance. Even granting

(what after all must necessarily be but a kind of guess) that £57 10s. worth of sheep manure is lost upon 460 sheep by the present system, account must surely be had on the other hand to the incalculably great advantage arising to light soils by being tramped by the sheep when on the turnip break, an advantage for which nothing that I know of can compensate. Then again let us look at the very great expense of carting home, (and this not like the dung in frosty weather, when horses may be otherwise unemployed) storing and apportioning to the sheep all the turnips, which if consumed on the field would cost a mere trifle. Regard must be had to these two points, and also to the abundance of straw; but the great quantity of stock kept and fattened is from his feeding with bean, meal, molasses, &c. As grass alone is only fit for rearing cattle, I never could find that they would fatten only in a straw yard. His apparent success with liquid manuring arises chiefly from the foreign manure he adds thereto. Might it not be as profitable to throw the guano on the land as into the tank? There is no reason to doubt that sheep will feed under cover—it is nothing new. 50 years ago almost every farmer had a few sheep kept along with the cows, and taken out every day with them during summer, and in winter were almost wholly confined to the house, and without turnips,—as at that period none were grown—and these sheep produced wool sufficient for clothing the family, and any ewes generally produced two lambs, which were mostly sold for 18s. or 20s. each, and the dung made by the sheep was considered worth double that of the cattle. No one will deny that some good results from the liquid proceeding from the byres, and I now give the results of my experience. Many years ago Mr. Smith, of Deanston, brought before the Gargunnoch Club his successful application of the liquid collected from the farm then in his possession, which however contained all the night soil, &c., produced at the village of Deanston; and no doubt the effect on the field in pasture where it was applied was wonderful; so much so that some were induced to have all collected from their byres and curtains into a tank, where a pump was placed to raise it into a barrel placed on a cart, and thence carry it to the fields; and the disappointment was great when after many waterings there was little or no visible change on the grass, and after the land came into crop no perceptible difference from that which got none; and after this was carried on for some years it was given up by every one. It clearly appears that there is but little in the liquid from the cattle of a productive nature, and that it is the infusion of other substances that produced the good effects: that Mr. Smith's was caused by what was collected from the houses, &c., in Deanston—Mr. Kennedy and others

from the guano and other substances thrown into the tank. I have never seen any thing brought before the public that was really profitable that was allowed to fall into disuse. Witness furrow draining, how it was scoffed at. I once advised a friend to begin a field in the Lothians before there was any of that kind of draining there, and he got to himself the appellation of the *Little Drain Farmer*, and his landlord actually interdicted him from proceeding, in the midst of the operations. Every one knows now to what an extent it is carried out. On the other hand the urine from cattle has always been given up, or nearly so, after many have put themselves to great expense. Let any one look at all that comes from a farm-steading sent over a field for a year or two, and how little a space it improves. Mine has run on some grass land for many years, and there is not an acre and a half improved by it. It has a good effect in rotting out the whins when passed among them. I would rather be for converting the liquid into solid than solid into liquid. If all the night soil, &c., &c., of our towns could be applied to the land all over Scotland, I hardly think guano would be much in request, were necessaries so constructed as to place a barrel on wheels beneath to receive the contents, and carry it to the fields. The effect would dispel all doubt. I have bought it in Fifeshire at 10s. a ton—4 tons a sufficient dressing to a Scots acre, mixed with ashes and earth.

An intelligent land agent in Glasgow (Mr. Gallo-way) informs me that on different gentlemen's estates in that neighbourhood, they made erections and tried the liquid manuring with no success at all, and that it is now given up on them all.

A few words regarding Italian rye-grass. I sowed it without a crop in the spring of 1836, had two fair crops. The Timothy grass sown alongside of it produced a far greater crop, but it is not easy to root it out again, when ploughed for corn. I still use Italian rye grass, mixed along with other grasses. I am fully of opinion that good red and white clover with rye grass, if you choose some Italian, make the best either for cutting or pasturing. In order to get an early cutting, I top dress with Berwick dung, fish refuse, and earth; also guano and soot in April. In a good season, by giving a second dressing, I get three cuttings, if there is plenty of red clover. I never could make more than two with any of the other grasses; and last summer, though top dressed with Berwick dung mixed with fish refuse, guano in April, and soot afterwards, I only got two cuttings—the last not so good, as the red clover entirely failed. In these remarks I only give what occurred with myself, and although so far short of that produced on the farms in Ayrshire, and the conclusions I have come to do not harmonize with

them, the fault may arise from my proceedings. What in all discussions of this kind ought to be avoided is, saying anything personal or offensive; the way to get at the truth is to state facts in a kind and friendly manner; for under different circumstances different results are obtained, and it is for the intelligent agriculturist to exercise his own judgment under the circumstances he may be placed. The difference of situation, climate, and soil, will always have a powerful effect in causing different opinions to be expressed on matters of this kind, and may be at some time substantially correct in each case. I quote the following from Professor Anderson's speech at the monthly meeting of the Highland Society, as reported in the *Scotsman* of the 25th ult., which I think bears out my statement on liquid manuring; "his statement (Mr. Russell's, Kilwhiss), that every pound of liquid manure lost is a bushel of wheat lost is true only in theory; and Liebig would himself repudiate the inference that the mere saving of that pound of liquid manure would enable the farmer to produce an additional bushel of wheat—for, be it observed, we have no practical means by which we can insure the whole of the manure we add to the soil coming into contact with and being absorbed by the plant. Much has of late years been said on the subject of the use and importance of liquid manuring, and various experiments on the subject have recently been made on a very extensive scale. I confess I have no expectation that liquid manuring in the strict sense of the term will ever be found advantageous in the long run; the old liquid manuring has been tried in other districts and abandoned, but that is no reason why experiments should not be made on the new plan recently adopted in Ayrshire. I believe that which is eventually come to will be in a great measure one of cost." So much for Professor Anderson.

FROM MR. DICKSON, PEELWALLS.

If liquid manure is to be used at all, Mr. Kennedy's system appears to me the only feasible one; the usual mode of leading it in and spreading it from a barrel is both ineffectual and very expensive.

I am sorry that owing to my total want of experience in its use I can offer no suggestions in regard to it; but I have always thought, and I continue of the same opinion, that if the buildings in which the cattle are fed were properly constructed to prevent its escape, there would be little to make use of; and in a district like ours where such a great bulk of straw has to be converted into manure, the whole liquid is requisite to assist the decomposition. Besides, I think in every way it will be as profitable for the farmer to apply it as a portion of his dung as in another shape. It may be urged

that liquid manure is more efficacious than dung for top-dressing grass and the growth of green crops; but owing to the great command we now have of artificial manures, that is rendered of much less consequence; and I am not certain, when all the various expenses are taken into account, but that they will be found as effectual and cheaper in the end.

FROM MR. JAMES CUNNINGHAM, COLDSTREAM.

Having been invited, along with other members of the club, to assist in discussing the merits of a system of management differing in some important respects from what is usually practised in this district, and which has been so fully and ably set forth in Mr. Milne Home's paper, and being fully aware of the disadvantages under which I labour, not being myself a practical farmer, and admitting fully that one established fact is worth seven opinions in such matters, I merely ask permission to draw your attention to a few of the more important facts presented therein. Having seen it in operation, and having read and thought a good deal about it, I confess that I am favourably impressed with its merits, and will briefly state my reasons why. It must be apparent to every one who has seen or read a description of this mode of management, that it primarily consists of maintaining and feeding upon the farm a much greater amount of stock than has hitherto been thought practicable; 2nd, a more systematic mode of raising green crops, and of consuming these, than has generally existed in this district. And though apparently these are not the all-important matters upon an arable farm, yet upon these will it be found that the most astounding results hinge, and before any one sets these lightly aside, or as of trivial importance, let him read the report of the Board of Health upon this subject; let him weigh well the facts collected and brought before us by Mr. Milne Home in his report; and, above all, let him go to Myremill, or any other place where the system is fully carried out, and judge for himself. The additional accommodation required, and the arrangement of the farm buildings, so that the animals may be conveniently housed and fed, and their manure collected and prepared to be applied to the soil, and especially to the green crops, by the aid of machinery, all of which you know something about, and any details of this process is not required on the present occasion, though I confess these more properly come under my field of observation. Upon the first head I have to remark, that where a tenant possesses the capital it will be found that to send beef, mutton, and wool off his farm, will be found more remunerating in the end, than sending off an equal value of the cereals. I have thought that any system of management

which tends to increase the luxuriance of the green crops, will be found to be an enriching and not an exhausting system; and every farmer knows that a luxuriant crop of broad clover, even though cut and carried off the field, collects and stores up in the soil excrementitious matter for the food of future crops, and farmers in some districts of England sow their fallows with wild mustard to get a green covering, which they plough down as a manuring only. Now if the growing of weeds (as we would call them) is really profitable, how much better to have your land cropped with nourishing food for animals, which will give some return in the first place, and secure the latter object of manuring as effectually. I would further remark, that to possess ample and convenient housing for such additional stock is desirable, even if obtainable by payment of a large per-centage. The proper construction of floors, channels, tanks, engine, pumps and pipes, are all deserving of special notice, and are all essential (as yet) to obtain a command of liquid manure at all times, without which the green crops cannot be forced forward in time, and to the extent necessary, that is, made available by the aid of these adjuncts, which upon a moderate sized farm has hitherto cost about 14s. per acre per annum extra. Some will say that if the sum expended in securing this supply were expended in purchasing guano and other foreign manures, it would produce great results; this is not disputed, but I question if any application of manure in the *solid state* would produce cuttings of Italian rye-grass 14 feet in length and 50 tons per acre in the season, which this system has produced, and the value of this as food requires not any comment from me. I may further remark, that the application of manure in a *liquid state* brings it within the power of machinery; and we all know the saving of labour effected by this mode when it can be made available; and wherever a water-power exists, with a plentiful supply of water, it would pay well to add the extra apparatus for carrying out the system fully. I think it will be obvious that this mode of management does not at all supersede any of the important processes of thorough draining, ploughing, cleaning, sowing, and reaping, nor, in short, any of the multifarious duties implied in what constitutes good farming; but if engrafted upon your otherwise general good management, it would impart to the whole a more perfect and fully developed system, enabling you successfully to contest and overcome the vicissitudes of the seasons, by supplying proper food at the proper season, prepared and consumed in the most advantageous manner, and will assuredly produce more profitable results than can ever be expected from following a system of feeding, over many of its drawbacks,

you at present have little control; and in a season like the present I think the most sceptical will be convinced that something is yet required to meet the vicissitudes of our climate even in regard to the feeding of sheep.

The CHAIRMAN having asked if there was any other gentlemen present who wished to express his views, and having also called upon Mr. Wilson of Edlington Mains,

Mr. WILSON said that he had not had leisure to give the report the consideration which he would have wished, nor to prepare a report such as those very able ones which had just been read. He had, however, been able to examine the report, and he must say, he could not but dissent from the conclusions Mr. Home had arrived at; and he very cordially concurred with most of the objections which had been brought forward. He did not, however, agree with the views expressed by Mr. Calder and Mr. Hardie, to the effect that no benefit whatever was derived from the use of liquid manure. That it was a most excellent manure he considered proved; and the practice of some of our continental neighbours, the Flemings, the Swiss, and others, who store it up and keep it for months, finding great advantages to result from it, corroborated this. But although he granted that the use of liquid manure might have very beneficial effects upon land, he did not consider that Mr. Milne Home had at all made out a case for the general adoption of such heavy expenses and extensive changes as would be involved in bringing this system into common use; and this he thought might be shown by the errors in calculation which the report contained. Mr. Milne Home estimated the expense of conveying the liquid manure to the places where it was to be applied, at 2d. per ton, and he considers that any sort of manure may be conveyed for 6d. per ton, so that he makes out a gain in the cost of applying the manure; but it was to be recollected that the liquid manure was diluted with three times its own weight of water, so that 1 ton was converted into 4, and thus, where in the old-fashioned system there was only the expense of conveying 1 ton, there was in this way the expense of conveying 4 tons. Thus instead of the cost of applying the manure being reduced, it was actually made greater. Another great objection was that the profits derived from the use of this system were entirely assumed. He would be exceedingly obliged to any gentleman who could show him how a profit of 10s. per ton could be obtained from green crops, according to Mr. Milne Home's calculation. He appealed to the experience of any farmer present, if he could convert green crops into wool or mutton or beef to realize a profit of 10s. per ton. It was possible perhaps

to do so in dairy husbandry in the suburbs of Edinburgh and other large towns, and Mr. Hardie had even obtained so much as 13s. per ton for grass which he had sent to Edinburgh. Dairy husbandry was, however, the exception in this as well as in the price of land, many places in the neighbourhood of Edinburgh yielding in this way a rent of £20 per acre; but he was quite clear that in ordinary farming it was not possible to obtain such profits. He was not going to enter into calculations as to how much could be realized from green crops. That depends in a great degree upon the turn the markets take, the seasons, and other conditions. This error in calculation ran through the whole report, and of course affected the conclusions considerably. The basis being erroneous, the superstructure falls to the ground. He could not but express a regret that Mr. Milne Home should have entered into these calculations at all. The experiments were very interesting, but there were as yet no data for making the necessary calculations of profit or loss. It was a pity therefore that these calculations should have been gone into at all, as they were both calculated to mislead and to damage and dishearten those who might think of attempting to carry out the system. Mr. Milne Home, he thought, would have better consulted his own reputation, and the cause which he sincerely wished to advance, if he had refrained from entering into calculations which he obviously had not the means to carry out. Mr. Wilson then referred to the enormous quantities of auxiliaries which Mr. Kennedy used, linseed cake, superphosphate of lime, &c., and which were used, and might be used, without any connection with liquid manure at all, and the produce of which ought therefore to have been estimated separately. Another curious circumstance was that it was stated that Mr. Kennedy gave a daily allowance of 160 lbs. of turnips to his cattle, and that the number of cattle which he kept was nearly 400. Now he could not see how, upon the quantity of turnips stated to be grown by Mr. Kennedy, the cattle could be kept long enough to fatten. According to his calculation, taking the crop of turnips at 20 tons per acre, according to Mr. Home's own statement, that number of cattle would consume the whole crop in four months. There was, however, some confusion in the data here. Mr. Kennedy's farm was divided into two parts, farmed upon different systems, and it was possible that these might have been in some way mixed up. Mr. Wilson then referred to the expense attending this system of manuring, and which Mr. Kennedy calculated at from 10s. to 14s. per acre. By adding the expense of constructing tanks and keeping them in repair, and the additional expense attending the applica-

tion of the manure in a diluted form, which of course increased its bulk, Mr. Wilson raised the expense of applying the manure by this system to 28s. per acre. Now if the 28s. was expended upon guano, and applied in the old-fashioned way, he was not satisfied that the results in the one case would not be as good as the other. Give the land as good a share of manure in the usual form as Myremill gets in a liquid form, and the effect will be quite as satisfactory. He thought, in fact, that the system was overrated altogether. He had an exceedingly high opinion of Mr. Kennedy as a man and as a farmer—he thought he deserved the thanks of the agricultural world for his zeal in carrying out these experiments. But he thought it was a pity that he (Mr. Kennedy) had not been allowed to carry out these experiments—for experiments he maintained them to be—before they had been brought so prominently before the public. That, however, was not Mr. Kennedy's fault. He had been drawn to make statements and give results, incomplete and uncertain in their character, which he would not have done had he not been interfered with. It was of course altogether unreasonable to expect him or any other man to expose his affairs by giving the balance-sheet which many people have demanded. At the same time, it is obviously impossible to arrive at the true results of the system unless we have that balance-sheet. He considered it improper to mix up the system of soiling and feeding sheep under cover with the system of liquid manuring. The merits of these systems were entirely independent of each other, and ought to be considered separately. He thought the system referred to in a letter from Mr. Dickson of Peelwalls, some time ago, as having been seen by him in England—viz., that of stall-feeding sheep upon burnt clay, and applying the clay to the land as manure—as one much more simple and less costly in its working, and much more easily comprehended in its results than that of liquid manuring. Mr. Wilson then sat down amidst the applause of the members of the club.

Professor JOHNSTON, having been called upon by the Chairman, said he had great pleasure in acceding to the Chairman's request to state to them the impression made on his mind on the occasion of his visit to Myremill with Mr. Milne Home some months ago. Before entering on the subject, he confessed he thought that there had not been that candid consideration of the circumstances under which Mr. M. Home had brought forward his report, and of the purpose for which he had brought it forward, given, which he (Professor Johnston) thought Mr. M. Home was fairly entitled to. It seems to me (continued the Professor) that if you

consider what a great difference there is between the condition of agriculture and agricultural progress, and the persons who promote it in this 1852, compared with what it was in 1752 in Scotland, you will see that one very great distinction is, that the proprietors of land now interest themselves in agriculture; whereas at the period to which I have alluded, it was considered beneath the dignity even of a small proprietor to know anything about it. The great difference is now that both in this country and in England, the proprietors are the persons who interest themselves most in the progress of agriculture, and I think they ought rather to be encouraged than discouraged in their attempts to point out and to effect improvements. I have felt, in the observations which have been made by Mr. Wilson, that he has not given due consideration to the circumstances under which the information in regard to these farms has been brought forward by Mr. M. Home. You will observe, also, that Mr. Gibson remarks that he considers the information was not sufficient to justify any conclusions being drawn in reference to the mode of operation at Myremill. Now, I am sure, so far as this point is concerned, if two strangers were to visit any of your own farms for the purpose of inspecting and noting down the particulars of your own methods, you would not be more willing than Mr. Kennedy is to lay your balance sheets before them. But as Mr. Home is desirous of introducing this system himself, it was natural for him to set about making the necessary calculations; and if you take with you this statement, which I had from Mr. Kennedy's own mouth, and which I entered in my note-book at the time, you will see that there is a fair ground for entering into a calculation with the view of ascertaining whether or not a profit is to be made by the system. Mr. Kennedy's remark to me was, that he had £10,000 capital embarked in his farm, that all the means and hopes of his family were dependent upon the success of his system, and that if he had not perfect confidence in the success of his system and his plans, he would not continue them. Now, the calculations given by Mr. Milne Home are based on data which we got from Mr. Kennedy himself. I will now make a few observations in reference to the system itself. I will leave out of view the farms of Enterkine and Cunning Park, and also the Fifeshire farm, and confine myself entirely to the farm of Myremill. The principle upon which the profits of the system there pursued depend, involves three considerations, viz., first, upon the application of manure in the liquid form; secondly, the application of this manure to the raising of certain crops; and thirdly, the mode of using up these crops in feeding cattle under cover. Now, in regard to the application of ma-



nure in the liquid form, it is the result of experience all over the world, that the application of a certain quantity of manure in a liquid form produces greater results than when in a solid form. This is very clearly shown in the application of dissolved bones when used in a diluted and undiluted form. Now at Myremill it is not merely the liquid manure that is used, but also the solid droppings of the sheep, pigs, and cattle, which are dissolved in the tank. This is a form of manure to which the observations of some of the gentlemen who referred to urine alone do not apply. The effect of liquid manure depends upon the condition of the land and the kind of crops to be raised. This latter observation is of particular importance in reference to the farms in Ayrshire. Liquid manure does not produce the same effect upon ordinary rye grass and clover that it does on Italian rye grass, on which its effects are very extraordinary. On cabbages, also, its effects are very remarkable and highly beneficial. Another observation I would make on this subject is, that the produce of a large quantity of grass appears to show that the amount of produce is not dependent so much on the nature of the land itself as upon a sufficient quantity of manure being applied to it. Mr. Kennedy maintained to us that he cut 50 tons of grass an acre per year, and though he did not tell us what quantity of guano he applied after each cutting, Mr. Telfer says he could apply as much as 20 cwt. with a profit, he using his grass altogether for the purpose of converting it into milk. Now, you will observe that the principle of applying it in a liquid state is founded not only on a sound theoretical basis, but is attended with sound practical results. The profit—the alleged profit—in Mr. Kennedy's case is derived partly from the application of manure in a liquid state, and partly from the kind of crops raised from it. The question, however, to be considered by practical farmers before adopting the system is, can a sufficient profit be realized to justify them or their landlords in erecting such machinery as we saw at Myremill? Now I am sorry to say that the impression upon my mind is not so favourable as upon Mr. M. Home's. My impression was that the expensive system of applying the liquid manure could not by itself yield a profit. This is irrespective of the other two considerations upon which I have stated Mr. Kennedy's farm to be conducted, and to which he looks for remuneration as much as to the liquid manuring. I do not mean to say that a more economical method of applying the liquid manure may not be devised; but my impression is that the preserving and distributing of the liquid manure as carried on at Myremill cannot yield a fair return upon the outlay. (Hear, hear.) If you ask me my reason for saying so, I should probably find as much dif-

ficulty in giving it as the reporters to the Board of Health would have in giving their reasons for thinking that Mr. Kennedy derives a profit from his system. At the same time, while I think the system at Myremill is not an example which in present circumstances practical men ought to follow, which those who have rents to pay would be justified in imitating, I think we are all very much indebted indeed to the landlord of Mr. Kennedy for the expense he has gone to, in conjunction with his enterprising tenant, in endeavouring to open up a new path in agricultural improvement. I think agriculturists generally are indebted to them, because whatever may be the merits of the system at present, and conducted as it necessarily must be in the expensive manner in which it is at Myremill, I cannot doubt that by and by we shall arrive at a cheaper, a more economical method of carrying it out, when its benefits will be extended to all. And while remarking upon the rather ungracious manner in which Mr. Wilson has alluded to Mr. Milne Home's efforts to lay all the information he possessed on this subject before the Club, I entirely agree with the sound and practical good sense which characterised the remarks he made on the system. I agree with him also in the opinion which I have heard he has expressed in regard to the report of the General Board of Health. I must say that upon the face of that report there appears an attempt to show only one side of the question—I do not say from design; but the reporters have not, I think, stated the case in the fair manner which would justify a practical man to take it up. It is because of the statements contained in this report that a more favourable impression has been made on the minds of many proprietors as to the merits of the system than I think it deserves, and that they have been thereby induced to incur expenses with which I scarcely think the profits will be commensurate. (Applause.)

Mr. WILSON said he would exceedingly regret if anything he had said would justify the inference of Professor Johnston, that Mr. Milne Home's report had been received and considered ungraciously. The terms in which Professor Johnston himself had just referred to the Board of Health's report furnished his apology, if apology was needed. Mr. M. Home knew well the great esteem with which he was regarded by the Club, and by himself personally, and he was sure he would acquit him of any intention to hurt his feelings or treat his report ungraciously.

Mr. MILNE HOME said he entirely acquitted Mr. Wilson and the other gentlemen who had taken part in the discussion of any personal feeling. He expected them to do just as they had done—to speak their opinions frankly, independently, and

honestly. He fully expected the errors he had committed to be pointed out, and he thanked them for the very able way in which his report had been treated—it had only proved what he knew before, that he wanted the experience of a practical farmer. In justification of his having brought forward his report, however, he would remind them that there were no fewer than seven farms in Scotland now conducted upon this system, besides others in England. He would remind them that there were practical farmers also, who entertained quite as high opinions of the system as he did. He had last year referred to the report of two Lanarkshire farmers who had visited Myremill, and who offered, if their

landlords would go to the expense of the necessary erections, to adopt the system immediately, and pay a fair interest upon the outlay. Mr. Russell of Killwhiss, a gentleman well-known to agriculturists, had expressed nearly similar opinions the other day, and Professor Anderson also viewed the system favourably. It was no damage to his reputation that he went wrong in such company. He concluded by referring to the natural prejudices in the minds of farmers against all innovation, and by pressing upon their attention the merits of feeding under cover, which, he said, this winter's experience presented in a very strong light.

## AGRICULTURE AND THE RURAL POPULATION ABROAD.

### LETTER No. XLIV. FRANCE.—No. XXVII.

#### THE VALLEY OF THE RHONE — ITS WINES — ST. PERAY AND HERMITAGE

[FROM THE SPECIAL CORRESPONDENT OF THE MORNING CHRONICLE.]

The wines of the Rhone hardly enjoy so great a degree of European reputation as the clarets of the Gironde, or the burgundy of the Saone. Yet from what has been accomplished in isolated spots on either bank of the former river, it is probable that a careful system of culture, with judicious crossing of the plant, would clothe the ridges of the precipices, and the high gravelly slopes, between which the rapid flood of the Rhone descends, with vineyards teeming with ample and high-flavoured produce. At present there are but two Rhone wines of anything like European fame—the sparkling growths of St. Peray, by many considered a finer and more delicately-tasted wine than champagne, and undoubtedly a much more harmless, because a perfectly unadulterated beverage; the other, the longer-famed production of those Hermitage vineyards which clothe with an unbroken carpet of vines the steep slopes of the burley hill round the buttresses of which the Rhone sweeps, contracted for the nonce into a narrow rock-pent stream, washing the walls of the little town of Tain, right under the vineyards on the one hand, and the feudal towers of the more picturesque and Rhine-like bourg of Tournon on the other. The esteemed growths of both these districts are white wines—St. Peray, a sparkling and vivacious drink; Hermitage, for the most part still and dry, and highly flavoured. An effervescing Hermitage is also made, but in comparatively small quantities. In both districts the quantity of the first-rate wines produced is small compared to the extent of liquor expressed from the grapes, for home or, at all events, French consumption. Red grapes of no particular value grow among the bushes which produce the delicious St. Peray, and immense quantities of red wine are yearly sent from Hermitage to mingle with the Bordeaux wines, and to give the weaker class that body and spirit which fits them for northern sea voyages and for the palates which they encounter upon their arrival. The Tain

people maintain that their growths impart to our English clarets their best qualities, and complain that the name of their wines should be totally lost sight of after the mixing. Without going the length of saying that the Garonne is quite so much indebted to the Rhone, there can be no doubt but that the red growths of Hermitage are finely flavoured, genial, and generous wines, I think the *vin ordinaire* commonly used hereabouts is one of the very best tipples of its class I have tasted in France—possessing much more flavour and perfume than you generally find, even in favoured wine districts, in the every-day beverage of breakfast and dinner.

As a general rule, the Rhone wines improve in flavour as you mount the stream. The vineyards in the Department de Bouches du Rhone produce poor stuff, possessing some spirit, but no flavour. The proportion not consumed at home is sent to the United States, to Brazil, and the old French colonies of the Mauritius, St Domingo, and Martinique. As we leave the plain behind at Arles, and begin to find rock and hill narrowing towards the river, the range of the Cevennes upon the left hand, and the tumbling masses of the Basses Alps on the right, the quality of the wines improves. The plant, raised from the marshy expanses of the level country, finds its beloved gravel and rocky slopes sheltering it from the mistral, and spreading out their southerly aspects all day long to the genial influence of the sun, alternating with the soft and humid *vent du sud*. The greater portion of Dauphiné thus produces floods of capital wine, the quality of which might be immensely improved were the growers to think of anything but quantity. The fact is—and it is not, perhaps, the least of the evils of the sub-division of property system—that it directly tends to deteriorate the general body of French wines, and immensely to diminish the wealth which would otherwise flow regularly into the country. Go where you will, to the Claret, the Burgundy, the Champagne, or the Hermitage districts, and you will

always find the productions of a few large proprietors ranking immensely above those of their poorer neighbours. No doubt the soil may do something, capital being always ready to purchase the best which offers; but careful and intelligent cultivation, the early selection of the fruit submitted to the press, in many cases long and scientific experimental courses, and crossing and improving the plants by means of different manures, and so forth, have, it is reasonable to think, had no small influence in raising to the rank of famous European beverages, wines separated perhaps by but a dozen feet of shingle from the plants producing a decoction unheard of beyond the huts and cabarets of the locality. But the small proprietor has no means of improving his productions. All his operations are conducted upon so miserable and hand-to-mouth a scale as to preclude anything like a scientific regularity. He has no intelligence or education to expend upon experiments—he has no capital to enable him to wait for lengthened returns; and so he proceeds year after year, striving only to extract every possible drop of liquid from seed, skin, and very often stalk; and finishing by producing a beverage which is commonly dear at a couple of sous the bottle. The question is, would it be better for France to have her finest grape-producing districts divided into large properties, cultivated by intelligent and enterprising capitalists, employing a race of regularly hired and paid labourers; and producing a beverage, which selling at a comparatively good price would necessarily pour wealth hitherto unknown into wine-growing provinces; or that the present system should always continue—petty proprietors furnishing the worst possible beverage at the lowest possible prices? There would always be plenty of poor land giving abundance of ordinary wine for every day consumption, while the soils of superior capability would be improved and caused to render to the country at large the utmost returns of which they are capable. Local wine tables, and statistical works, unite in pointing to scores of localities in the lower valley of the Rhone, where the grape might be cultivated into being a source of wealth for the district. Towards the French Alps, to the east of the Department of the Drome, a fine wine, of very great capabilities, and hitherto unknown to fame, is said to be produced. It is a species of Sherry, but is only locally known. Near two obscure towns in the same department, those of Saillons and Die, a sparkling wine, also of capability, is, I am told, produced, a pleasant and vivacious dinner drink. Its local name is Clairette. Another good wine of somewhat extensive country reputation, is *Bresme*. It is unknown in trade. An inland commerce in several of the less famed Rhone growths is carried on—the wines of Roneas, Montélinar, where the mulberry was first cultivated, and a vintage of excellent qualities, that of the Donzere district, all in the department of the Drome, being more or less consumed in the neighbouring large towns—from Lyons to Marseilles, and from Grenoble to Clermont. As a general rule throughout the valley, the hill vines are superior even to those grown upon the elevated gravelly plateaus which frequently stretch backward from either bank of the Rhone. Where broken and powdered gra-

nite enters into the composition of the soil, the wines are generous and finely flavoured. A flinty earth produces the next best class; a dry chalk soil comes third; and the heavy wet lands produce the worst beverage of all. The first growths of St. Peray and Hermitage always spring from a decomposed granite soil, the stone appearing to exercise a peculiarly genial and forcing influence upon the plant. The vines are cultivated with or without supports (called chasselas) on the plains; they very frequently serve for hedges, dividing the fields, or rather patches, of different proprietors. Occasionally, I have seen them trellised along dwarf mulberries. Horizontal lathes are seldom used. When the vine slips shoot above their chasselas, as sometimes happens, they are secured to the top of the next supporting stake, so that the vineyards have frequently the appearance of fields of tiny green arches. Regularly trellised vines are pretty things to look at; but their appearance is always a sign of unintelligent cultivation, and a token of bad wine. In such vineyards the branches of the plant are allowed to grow too luxuriantly, and the fruit has neither enough of air nor of sun. Along the steeper slopes of the hills the vineyards are frequently terraced—hardly an inch of ground being lost—up to the very tops of hills rising at least 1,200 feet from the river. In appearance these plantations are almost identical with their Rhine brethren; and, indeed the picturesque little rock-built town of Tournon, with its high perched feudal tower, backed by steep vineyards scrambling as it were in a flight of long pately steps, up the sheltering mountain ridge behind, forms a perfect fac-simile of a Rhenish picture. A few of the vineyards are ploughed, particularly when lines of new plants are to be laid down. The great majority, however, both upon the hills and the plain, are painfully cultivated by hand labour—heavy picks (*pioches*) being used, of different shapes for different qualities of soil. In rocky ground, the blades of these instruments are swallow-tailed, and they are uniformly very short-handled and very heavy. The vineyard labour is consequently severe. The people are continually complaining—at least, many labourers did to me, in the Hermitage district in particular—of the continued stooping, which gave them pains in the back and loins; yet the innovation of a longer handle to their picks is far too daring a flight of fancy for these good jogtrot wine-makers. I could hear no intelligible reason for the shortness of the *manche* of the vineyard tools. The fact is, however, that it is easier in France to change a dynasty or overthrow a religion than to alter the shape of a ploughshare or the construction of the teeth of a harrow. Every day accumulates the number of incidents which prove the perfectly farcical tenacity with which the rustic holds on to his ancient tools. Take a couple of instances. The collars universally worn by French horses, although they are said to be easy and sit well upon the animal, are of absurd size and weight. Many of them cannot weigh less than 30 or 40 lbs.—no small additional load to place wantonly on an already well-burdened animal. Vast peaks of leather, sometimes iron-tipped, tower as high as the creature's head. In the south, a couple of curly wooden horns are added, and on these

bright glass rings are frequently hung. Altogether the affair is an absurd piece of elaborate clumsiness. In going through the stables of M. Guebhard's farm, near Avignon, I observed east away in a corner some half-dozen of reasonable looking collars, but half buried amid cobweb and litter. "Ah!" said my conductor, "these were the light collars I got made for the farm horses. I had all the difficulty in the world to induce the men to use them. And now, as soon as they have got a chance, the innovations are flung aside, and the cumbersome old machine immediately resorted to." A proprietor in the Craue—where, as I have already described, the spirit of agricultural enterprise has been of late partially awakened—purchased and imported at considerable expense, the duties being very heavy, sets of English agricultural implements—ploughs, harrows, drills, and so forth—which he distributed among his farmers. Not one would have anything to do with the newfangled notions; and it was at length found that the people were in the habit of knocking the first-rate English implements to pieces, to repair their own barbarous ploughs and harrows with the fragments.

To return, however, to Rhone wines. St. Peray is a growth of the Ardeche—the vineyards lying upon the right hand of the river, upon either side of a ridgy glen, which here breaks through the high rocky wall skirting the valley, and runs back from the Rhone towards the highlands of the Cevennes. At the bottom of the gorge lies the village of St. Peray—a not over clean collection of narrow streets and steep and tortuous lanes. The southerly-looking slopes, which rise almost immediately behind the houses, and stretch away far up the glen, are one mass of vines from top to bottom. The opposite hill is vine-clad only about half way up; some small patches of corn land, scattered in the most sheltered *correys*, succeed; and then heath and rock take the place of vine and wheat. On the extreme and corner pinnacle of this hill is perched one of the most magnificently situated feudal ruins in France, the walls of vast thickness, towering from the very edge, and seeming to form a continuation of a precipice sinking—with one inconsiderable break—sheer downwards upwards of 500 feet; and the ruins of an ancient rampart, encircling the blackened and shattered *debris* of what was once the village dependent upon the *fortin* clinging round the peak of the rock under the shadow of the crowning towers. The vineyards upon the southerly exposure produce, of course, the best wine; and the portion of them yielding the finest growths is comprised in a waving strip running along the side of the hill, and comprising nearly the lower third of its bulk. Above and below this boundary, the quality of the wines falls off. A great portion of the hill, towards its summit principally, is divided into small freeholds—the proprietors residing for the most part in the village, and manufacturing every year a quantity of still white wine, drunk in the district. The St. Peray Grand Mosseaux is almost exclusively the production of the vineyards of a single grower—M. Faure, whose chateau stands beneath the most favoured slopes. The vines of the small proprietors would also produce sparkling wine—probably, for the most part, of good quality—

but the process is very expensive. The Mosseaux wine takes a long time to ripen in bottle, so that without capital the business could not be carried on. The vineyards of M. Faure are partly cultivated by day-labourers, paid from 30 to 40 sous—according to the importance of the work and the length of the day, partly managed on the metayer system, the farmers who take the management having a right to one-third of the produce—an amount which M. Faure generally buys from them every year at the market price of the wine; so that even these cultivators are in reality paid a wage varying with the quantity and quality of the harvest. The day labourers are ordinarily employed in the above ground work of the vineyard—changing the *echelas* and pruning off the *sarments*. The operations of the metayers are very closely watched. The great object of the proprietor is, of course, the quality of the wine: that which the metayers cannot be got to lose sight of is the quantity; and the result is that, were they not strictly watched, they would not trim the vines closely enough, having always an eye to the number of branches, and the consequent amount of clusters of grapes. As it is, the shoots upon each plant which have produced the most plentiful harvest are cut from their junction with the stem, leaving the whole returning vigour of the plant to develop itself in young branches, which bear the tenderest and most delicious fruit. The grape is of a fine golden hue, and very sweet, frequently, about the vintage time, bursting from excess of richness. The earth, or rather granite gravel, is carefully turned up, and loosened every year round the roots of the plants; the delicacy of the operation consisting in thoroughly stirring the soil without damaging the branching or *piroting* underground fibres of the shrub. Manure is copiously applied when young slips are planted, and for the first few years of their growth. The older plants get on without any artificial nourishment. The compost employed is generally decaying box leaves, mixed occasionally with the gummy fibres of the fir tree—the latter forming a strong and pungent manure. The box grows wild upon the hills of the Cevennes, as it does amid the Pyrenees.

The process of preparing the sparkling St. Peray wine exactly resembles that of ripening and imparting its sparkling qualities to champagne—with this exception, that the former beverage is perfectly pure, the grape giving it all its sweetness, whilst the latter is very extensively dragged with sugar or sugar candy, dissolved in white or red wine, and technically known as *liqueur*. This stuff, besides giving champagne its sweetness, is also used to give it colour, the delicate hue of pink champagne being neither more nor less than the effect of the glassful of bright red wine, used as a vehicle for the sugar candy.

The vintage of St. Peray takes place in general at an early period of the season. The grapes are never trodden under foot—a peculiarity which attaches itself to most of the sparkling French wines—but at once subjected to the action of the press-soirs, very powerful instruments, yet capable of a nice adaptation of force. The juice is at once ponned from the vats into the casks without waiting, as is generally the practice, for the fermentation.

In the following spring, at the commencement of the warm weather, the wine is bottled and then allowed to remain for several years, from three to five, for the liquid to settle, fine, and ripen. This mode of treatment of course involves the necessity of an outlay only tardily repaid. The ripening process is made the more costly by the continued bursting of the bottles as the wine passes through its first stages. The loss incurred in this way amounts to about 15 per cent. of the entire quantity bottled, and it usually happens that the better the vintage the greater the breakage. A similar misfortune occurs in the champagne cellars at Epernay and Rheims. In the latter place it is stated that in one year, and in one establishment, between 400,000 and 500,000 bottles have exploded. This was in a peculiarly warm spring time. In St. Peray the bottles are piled in open racks and lath ledges, so as to admit of the easy withdrawal of the broken glass. The wine having lain the requisite time, the racking process is commenced. All the sediment has been already deposited in the lower side of the bottles, but the process of getting rid of this undesirable beeswing is difficult and tedious. The bottles are transferred to shelves pierced with holes, down which their necks are inclined. The degree of slope is delicately adjusted. At first the bottles are very slightly slanted; then day by day they are jerked more and more out of the horizontal, the dregs by degrees sinking towards the corks, until at length, after months of attention, and nimble manipulation, the bottles become placed vertically, with the whole collection of sediment resting upon the cork. I was astonished to learn that if the bottles had been at once tilted to a perpendicular position, the dregs would, nevertheless, still have been deposited upon the sides and bottom; and that even if the sediment had been allowed to settle, and the flasks afterwards at once set vertically, the deposit in the neck and on the cork would be partial and unsatisfactory. During the process, from beginning to end, each individual bottle of the many thousands in store receives several hundred shakes. Then comes the operation of degorging. Each bottle is taken up, the string which confines the cork cut, and the sediment allowed to fly with the upward burst of the effervescing wine, the vacancy being filled with fresh liquid, and the bottle, without a moment's delay re-corked. The operation is one, for the adroit performance of which a manual dexterity, amounting almost to slight-of-hand, is required. The great point aimed at, is the getting rid of as much of the dregs as possible, and as little of the wine, the thumb of the operator being skillfully used to control the discharge. It seldom happens that the wine is sufficiently purified by the first degorgement. If not, the process is several times repeated, and on each occasion the bottle is stopped with a new cork. The process of champagne making is, I believe, almost identical. I had an opportunity of admiring the rapid manipulation of M. Faure's workmen in his principal dépôt above St. Peray. The building in question has an odd history. It is situated on the top of a steep and rocky eminence, one of the spurs running from the broken range of precipice on the top of which stands the Chateau de *Crussol*. The place was once a feudal fortress, and the vaulted cellars where the good wine

ripens, and which ring all day with the cheering pop of flying corks, were once the dungeons of the seigneur—enormously strong, and drearily gloomy, being only lighted by loopholes placed high in the thickness of the walls. The proprietor of the place, in or after the reign of Louis XIV., seems, however, to have been an enthusiast in the study of fortification, and so converted the crumbling old feudal stronghold into a mimic fort, engirdling it with ramparts, moats, bastions, ravelines, and so forth, all after the most approved designs of Vauban. These flanking walls are merely bricked toys, which, if ever they had any use, must have served rather to prevent people from getting out of the chateau than to hinder them from getting in, the central building, after it was disused as a dwelling-place, having been occupied as a prison. It was down in these quadrangular dungeons I saw the process of bottling St. Peray. The corks appeared double the size of the necks of the flask, but they were squeezed in with great rapidity by the help of machinery. The bottle was first placed in a sort of iron press, the cork dipped in wine, committed to the tender mercies of a moving vice, which, in answer to two or three twists of the mechanism given by the workmen, squeezed with as many jerks the lower end of the cork to half its bulk, at the same time screwing it forcibly down into the bottle in such a manner that the circular wrenches twisted and warped the fibres of the wood, and prevented the slightest future escape of gas through the pores. The bottle was then handed to a second workman, who, with two or three gashes of a knife, pared the cork to the shape of that ordinarily used in champagne bottles, and, applying wire and twine, fastened down the impediment with marvellous dexterity. Most of these workmen are engaged by the year, at the rate of about 2*l.* per day. They are of course a different class to the vineyard labourers, their whole work being in-door.

The St. Peray vintage is opened by an edict of the mayor. I was the more particular—as the point seems to have attracted some attention—in inquiring of the best authorities the cause of the custom—and was told that an official opening of the vintage is deemed requisite in St. Peray, not so much on account of the danger of one man's thieving his neighbour's fruit were each to begin at different times, although by informant believed that that was a minor consideration, but principally in order to check the tendency which is said to exist among the cultivators, particularly the smaller ones, to gather in the grapes before they are fully ripe. It is always of importance for a district that the general or provincial reputation of the wines of each year shall stand as high as possible. The smaller cultivators, however, always looking for quantity, are usually so eager to begin, that it is found advisable to put the whole district under strict regulation, and to have the condition of the grapes examined into by a jury of experts, so that individual opinion being laid upon the shelf, the whole body of cultivators may start fair at the moment pronounced the most auspicious, not for any one patch of ground, but for the general interests of the whole community. One can hardly help, however, I think, deeming the practice but scantily supported upon

any or all of the grounds on which its existence has been placed. But the strange anomalies which hamper personal freedom of action in France are perpetual. For instance, a fire lately broke out almost opposite the windows of my hotel at Valence, and I was much struck with the apparently instinctive habits of discipline and military order which the people exhibited. Almost as quickly as a regiment would have fallen in, two long lines of men were formed from the banks of a running stream which traverses the town to the spot occupied by the engines, an endless chain of full and empty buckets flying with marvellous rapidity along the upward and downward ranks. Thanks to this speedy water supply, the conflagration was soon got under, and the assistants, who had laboured with great enthusiasm in the cause, so long as they had the excitement of a blazing house before them, began to pall in their ardour, and to slink slyly out of the ranks when the water was only required to slake the heated ruins. Retreat was, however, in most cases, more easily attempted than accomplished. The spot swarmed with gendarmes, sergens de ville, and all the hundred agents of French military police, who immediately, on a fellow breaking out of the ranks, gave chase, captured, and brought him back ignominiously to the bucket. Nay, all idle bystanders were seized by the shoulders, and promptly hustled into line. One young fellow in a blouse made a most energetic resistance, shook off the gendarme who had collared him, and took to his heels. A brisk chase ensued, and the "authority" being longer in the legs and stancher in the wind than the recalcitrant, caught him right under a plaster statue of Liberty, which stands on the Boulevard, led him back to the scene of action, and soured him from head to foot with a bucket of water—no agreeable salute on a foggy December morning. Altogether the scene from first to last was anything but devoid of significance and moral.

I have had several opportunities in this part of the world of tasting—perhaps something more than tasting—the soup ordinarily used, always twice, and sometimes three times a day, by the peasantry. Its main ingredients are potatoes and bread, with, in some cases, a little fat bacon—in others, a morsel of butter. The potatoes are much boiled, so as to make the liquid a thick vegetable soup, and the mess is often flavoured with onions. I do not know how I should have thrived upon the fare three times a day as a continuance, but the dish appeared to me a tasty and nutritious one. At any rate, when the quantity of animal food to be consumed at a family meal is very small, employing it to strengthen soup appears the best and most economical fashion of using the too scantily supplied morsel. Were it not, indeed, for their skill in the concoction of *potage* and all manner of savoury messes of boiled and stewed vegetables, the French peasantry would fare ill indeed. During the Peninsular war, the culinary skill of the French soldiers is said to have preserved them in better health and condition than our own brave fellows, upon the same or, perhaps, inferior rations. The Englishmen incontinently roasted or boiled their cuts of tough bull-lock beef upon the embers of wood fires. The Frenchmen clubbed into parties, and by soups and

stews, with vegetables, managed to make a very little go a very great way. The absence of actual pauperism was much boasted of to me in several points upon the Rhone. "We have," I was told, "many poor people, but none *qui tendent la main*." In a small parish in Ardeche, in which the excellent family of the principal landed proprietor is resident, I was told that there were two individuals who took alms openly. The whole population amounted to 400. There were several others who would gratefully receive a little passing assistance in the extreme dead season of the year, but only if it were extended silently and unknown to the neighbours. Property here was much subdivided, and, I fear, much burdened, but the "*rage d'acheter*," as I heard it phrased, was described as being still by far the most striking moral point of the population. In this part of France—indeed, throughout the south in general—there are annual migrations of portions of the population to a considerable extent. Winter sends crowds of the inhabitants of the far-off hamlets of the Alps on one hand, and the Pyrenees on the other, down upon the plain, to pick up a living as they best can. When I approached the Pyrenees, it was at the commencement of an unusually early winter, and the streets of every town, particularly Tarbes, which is the central point of the locomotion of the district, were swarming with boys, acting as shoeblacks. The swarms astonished me, and I could hardly conceive how they could get employment at all, unless, indeed, they were to take each to polishing the *chaussure* of the other. At Arles the same thing was the case. The *decroutteurs* were the juvenile inhabitants of the Piedmont mountains, and they generally added chimney-sweeping to their ostensible business. In fact, all manner of wretchedly paid and disgusting work falls to the lot of these happy-looking Helots, who are laughing and singing from morning to night, and who generally manage also, small as are their gains, to carry back in the spring time a small parcel, say from 15 to 20 hoarded francs, to the mountains. None of these boys whom I questioned, and they were several, could read or write. In the commencement of summer, again, there are several hundreds of people who descend from the Dauphny Alps for the sheep-shearing in the lowlands, before the herds are driven to their upland pastures. These individuals frequently wait for the first hay harvest, and carry back to their hills, I am told, from 50*l.* to 60*l.* for each month of their sojourn on the plain. In the winter time, the Dauphny mountains also send down a band of industrials, who employ themselves in combing hemp, and in clipping horses and mules. They gain on the average from 50*l.* to 60*l.* for their whole stay. From the Ardeche hills, some 500 or 600 individuals descend yearly for harvest-work, silk-worm rearing, and the vintage. In some districts the mountain population migrate to the plains in seed-time, with ploughs and oxen, and find employment at the rate of 3*l.* per man and team per day. Early in winter, the women descend to card and spin wool. They earn from 40*l.* to 60*l.* per day, with board and lodging. I may add that some of the best masons in the valley of the Rhone are Italians from Piedmont, who pass the summer in France, carrying back, it is said, from 300 to 400 francs; and that all the

wandering artists in iron—"the weary knife-grinders," tinkers, and so forth—are to a man Auvergnats.

Passing upwards from St. Peray, I pause for a moment at the famous vineyards of St. Hermitage. Here occurs one of those magic colonies of stones which give to the grape one of the highest and most exquisite of its flavours. Possibly, the holy men—for it is said that there was quite a settlement of hermits upon the hill—possessed some early information of the virtues of the soil. Popular tradition indeed ascribes the excellence of the wine to the qualities of the original plants, and maintains that one of the hermits, who had extended his wanderings as far as Persia, brought to France slips of the vine of Shiraz, and that *hinc ille lachryme*. Whether there existed such a provident hermit, however, or no, Hermitage has had a very long and very deserved vogue in France. Boileau talks with disdain—

"D'un aurnavat funeux qui melé de Lignage,  
Se vendait chez Crenet pour vin de l'Hermitage."

The wine, however exquisite as is its flavour, was, until a comparatively recent period, unknown out of France. At present from 5,000 to 6,000 hectolitres are annually made, and in a great degree exported to England and the north of Europe.

The vineyard of Hermitage puts one considerably in mind of a Rhenish vine hill. The mountains hereabouts, on either side of the Rhone, advance so as to contract the valley of the river to a comparatively narrow pass. Upon the left bank the hills rise bluff and burly, and then, trending backwards from the stream and sloping to the south-west expose to the long summer-day's sun the steep slopes of Hermitage. The mountain, from top to bottom, is one mass of vines, divided here and there by steep and narrow footpaths enclosed within walls. The finest wine is produced in a strip of ground stretching horizontally along the hill near the bottom, and carefully walled in. The property of the mountain is exceedingly subdivided. There are a few tolerably large holders, but great numbers have only a few ranks of vines. These proprietors are frequently inhabitants of the adjacent towns of Tournon, lying opposite to Tain, on the left bank of the Rhone; and when they are not so socially situated as to be obliged to cultivate their patches themselves, till and prune their vines by means of day labourers.

The Red Hermitage is, as I have stated, sent for the most part to Bordeaux to mix with the clarets of Medoc. It is produced of two kinds, from two species of grape, the little and the great *syros*. The former, an oval-shaped fruit, produces the strongest and most perfumed wine; but the two growths are generally mixed. The true Hermitage is, however, a white wine. It is produced from four kinds of grapes—the little and the great Roussane, and the little and the great Marsanne. The first two species afford a dry and strong wine: the others give a sweeter, softer, and more highly perfumed product. A judicious mixture of the twain yields the finest Hermitage. The juice of the little and great Marsanne produces alone an excellent wine, and care must be taken that that of the

little and great Roussane is not mingled with it in too liberal a proportion, the result in such cases being a compound, weak, mawkish, and void of the pure Hermitage flavour. The juice, after being expressed in the usual pedal fashion, is allowed to ferment from eight to ten days. It is then drawn off, always into new casks. The wine improves for seven or eight years in wood, and keeps well for three times that period in bottles. A common idea among *soi-disant* amateurs is that Hermitage has a flavour of the raspberry, and it is said to be a common trick with wine concocters to introduce the essence of that fruit into their beverage. The fact is, that the true wine has no raspberry savour whatever. Its proper *gout* is peculiar and very subtle, and must be tasted to be appreciated.

A peculiar species of the wine called *vin de paille de l'Hermitage*—a sweet semi-liqueur wine—is made by drying the grapes upon beds of straw, or in some cases by hanging them up in clusters upon cords for a month or six weeks. The fruit is then trodden, but only the pure juice is allowed to go into the vat. The fermentation does not commence for several months. It then proceeds very slowly, lasting sometimes for years. The result of the operation is always hazardous: sometimes the beverage turns out good for nothing; sometimes it becomes a golden-hued and highly flavoured sweet wine. The wine is seldom sold until at least eight years after the vintage season. Only one or two proprietors venture upon the dangerous speculation of the *vin de paille de l'Hermitage*.

The Hermitage grapes grow upon plants, each trained to its *echelas*—a stick of from four to five feet in length. Occasionally the longer shoots are attached arch fashion to the extremities of the neighbouring slips. The pruning operations are conducted yearly with great care and labour; the main shoots being regularly cut off close to the stem of the plant, so as to allow all the vigour of the shrub to develop itself in fresh young slips. As soon as any symptoms of decay become visible, the vine is at once rooted up and a seedling planted. The latter begins to be productive in about five years. The average profitable age attained by the vine, is from 60 to 80 years. A few die previously to the former period, and a few outlive the latter. The degree of age attained by the vines very generally depends upon the exact quality of the soil in which they are set, and upon the care bestowed upon their culture. The vineyards are exclusively laboured by hand. Manure is placed only round the young plants for the first few years of their growth, and occasionally to the roots of the older shrubs which present any indications of premature decay. The compost ordinarily employed is stable litter. A south-westerly exposure produces the best fruit. On the hills sloping to the east it is said that the rays of the sun acting upon the dew drops form lenses, the effects of which are to scorch and scathe the stems and leaves of the plant.

The general aspect of the Hermitage vineyards is that of a steep, bluff hill, its slopes undulating in sweeps, its soil either masses of crumbled chalk or granite clothed in an unbroken garment of vines, the leafy expanse only varied here and there by the white lines of loose stone walls—marking where

narrow tracks run deviously along the face of the ascent. Up these difficult paths the whole of the manure used has to be conveyed upon the heads or backs of the labourers. At the bottom of the hill, a whole range of dunghills, belonging to different proprietors, are established; and between these repositories and vineyards perhaps 600 or 700 feet above, the work people—often children and women—are continually toiling with their unsavoury loads. For this species of work they earn from 10 to 15 and 20 sous per day, according to age and strength. The labourers who loosen the slungly earth and lop the vines make from 30 to 40 sous, and perhaps something extra at vintage time. One frequently sees and hears contrasts drawn between the too fre-

quent difference in the condition of producers and consumers, particularly when the articles in question are those of luxury. But I thought I had never encountered any such comparisons so striking as that which the aspect of the Hermitage vineyards unavoidably suggested. The wine produced, every one knows, is one of the finest, and, for its first growths, one of the dearest in the world. One could hardly help, then, contrasting the circumstances and position of the class by whom the generous liquid would be consumed with the aspect of the producers—ragged women and children, dripping with perspiration as they toiled in Indian file up a long and severe ascent, each bending under a huge bundle of fetid manure borne upon the head.

### ORIGIN OF THE BLIGHT IN WHEAT.

SIR,—The importance of the subjects on which I address you will, I hope, be a sufficient excuse for troubling you with my present communication.

Last year almost all the wheat in the south of England was more or less blighted; and when one hears opposite and contradictory opinions expressed at scientific meetings, farmers' clubs, and at the market table, as to the origin of the blight, the necessity of arriving at a correct conclusion appears more palpable than ever.

The theory here advanced is not at all new. The late Mr. Badcock, of Pyston, reported his experiments on the growth of wheat to the Board of Agriculture so far back as the year 1819. He stated his conviction that blight commenced at the *root* and not in the *blade* of the wheat plant. I will give the substance of his remarks. He observes, "The infant plant sown at Michaelmas is supported through the winter by the seed, and also by some crown roots, which by the month of April die. At this season the coronal roots have shot freely, and by the time the ears are formed have descended as far as three or four feet. At that depth, being beyond the immediate rays of the sun, they are not hindered by its influence from making a still further descent. As the land becomes parched by drought at or near the surface, the supply of nourishment to the plant depends on its support from that or a still greater depth. By a long drought the covering of the capillary vessels becomes weak and elastic, and by a superfluity of water, that element, which they have long sought for, is eagerly taken up, and propelled with unusual velocity through the vessels of the plant. By the sudden revolution from want to superabundance of food, the vessels of the roots and stalk become more extended than their strength will admit; hence arise exudation of the roots and fungus in the stalk, which in a great measure deprive the infant grain of that nourishment which is required to bring it to maturity." This will explain why light soils are more subject to blight and mildew than clays, and also assign a reason why blight appears partial in the same field. Many subsoils vary, though the surface may appear even. The substratum that is retentive of moisture in a long

season of drought furnishes support to the wheat plant; while the beds of gravel, being thoroughly dry, cause the capillary vessels and roots to seek more eagerly and more extensively for nourishment. If the light soil be highly manured, the fibres are taxed to a double extent to maintain the artificial luxuriance of the blade. On moderately warm soils, should the weather continue *dry*, the roots remain healthy, and support the plant to maturity; but should deluges of rain take place, the sudden change is too much for the over-distended capillary vessels—and mildew and blight are the consequence. The scorching tropical heat of last July, succeeded by very many heavy thunder showers, caused the blight of 1852.

I do not presume to suggest any remedy for this extensive disease, but I hope that attention being directed to its real origin, there may be some slight chance of combating the evil more effectually.

Your northern correspondent in this week's *Express* stated that "*Fingers and Toes*" in turnips were caused by *wireworm*. It is singular that this disease often occurs in fields where a wireworm is never seen, and where its devastations on other crops are never felt! Mr. Singer says, "White turnips are most affected with '*Fingers and Toes*,'" while Mr. Lemond asserts that "*Swedes* are more frequently the victims." I have seen this disease attack not only swedes and white turnips, but also *mustard* and *rape*. At present I have never known an instance where 100 bushels of good *lime*, or a liberal dressing of *chalk* or *marl*, applied before the turnip crop, would not cure the disorder. I may mention a singular fact to illustrate the depth to which the turnip rot occurs. Last year some deep sandy loam resting on a stone brash was drained with  $1\frac{1}{2}$ -inch pipes at 3 ft. 6 in. *deep*. The field was sown with vetches, which were fed off, and followed by white turnips. A short time since some of the drains did not act, and it was discovered that the roots of the turnips had penetrated to the pipes, and, in some instances, entirely choked them.

I am Sir, your most obedient servant,

26th Jan., 1853.

OXON.



## CULTIVATION OF TURNIPS.

SIR,—The publication of the weight of turnip crops is always interesting and instructive. It has become fashionable for amateurs to give the result of their cultivation, but the practical men have fought shy of their deeds being known; I therefore hail with pleasure the announcement of the result of the experiments made by Mr. Johnson in the growth of roots by the aid of special manures, detailed in your journal of the 24th. Mr. Johnson is no novice in the art of root culture; in a circuit of 25 miles around Doncaster he obtained the prize for the best cultivated farm. And the shrewd observer, Mr. Caird, in his *English Agriculture of 1850 and '51*, states that the farm of Mr. Johnson, of Cheviot Grange, between Wakefield and Barnsley, may be taken as a favourable sample of the arable farming of the lower district of the West Riding.

It is not, therefore, a Mechi or a Sir John Conroy, "scientific" with heavy purses, that has ventured to proclaim to the agricultural world the result of his turnip husbandry; but a practical man has stepped from the ranks, and declared that with all his skill, and with the aid of 25s. worth of artificial manures per acre, he has obtained 17 tons 16 cwt. of common turnips per acre. What will the Scotchmen say to this great deed? and what our Irish resuscitating friends, with their 55 tons of swedes per imperial acre? and Mr. Smith, of Lois Weedon with 27 tons of swedes per acre, and 240 bushels of early potatoes besides? Surely there must be some secret in turnip growing that has not yet been divulged in the West Riding!

Before we put the question, How is it that Mr. Johnson produces such an exceedingly low produce of turnips? it may be well to hear Mr. Caird's statement of the usual mode of turnip culture on the Cheviot farm. "In the preparation of the land for the turnip crop, the wheat stubble is ploughed with three horses a-breast, a deep strong furrow, and the only deep furrow given in the course. In spring the land is wrought to a sufficient degree of fineness by repeated ploughings and harrowings, or 'dressings' as the conjoint operation is termed here; after which six loads an acre of manure from the farm-yard are spread over it, and lightly ploughed in; lime is applied once in eight years at a cost of 36s. to 40s. an acre. The seed is then drilled on the flat, the drill at the same time depositing a mixture of eight bushels of bones and two cwt. of superphosphate per acre. The rows are 19 inches apart; and when the turnips are ready they are hoed twice and horse hoed. About 1-15th of the crop are swedes, the rest white and other soft turnips. Almost the whole is eaten on the ground by sheep, which are confined by nets, and shifted from space to space as the crop is consumed. The sheep eat the turnips from the ground, the scooped out bottoms being afterwards 'dragged' up to be eaten. Boxes, with cut straw-chaff and a little

salt, are placed for the sheep to eat. The turnip crop is reckoned to keep eight or ten young sheep for 20 weeks."

Mr. Johnson states that the experimental patches of turnips were seeded the 2nd of June. We may, therefore, presume that his practice is to sow common turnips as early as the first week in June.

Mr. Caird further states that "The land is good sound land, capable of growing good crops of wheat and barley, and dry enough for eating the turnips off the ground."

With the above clear statement before us, it is fair to ask, Why is Mr. Johnson's practice accompanied by such slight success? Is the first week in June too early for sowing the seed; or is 19 inches too close to draw the drills? The soil appears to be suitable; the first ploughing in the autumn, a deep one. Mr. Caird states that the farm is clear and in high condition. Mr. Johnson is liberal in his manures, and yet his crop of inferior turnips is 10 tons an acre below the same crop of the intelligent farmer at Lois Weedon.

The readers of the agricultural publications may naturally be surprised to know that a crack Yorkshire farmer is satisfied with 17 tons of common turnips an acre, and that in 1853 they are still eaten on the ground without the aid of a "Gardener's Cutter." The climate is cool and moist in the neighbourhood of Wakefield, favourable for root culture. Can any of your readers solve the question, and give the reason why good sound land, capable of growing, on an average, five quarters of wheat an acre (Caird) in high condition, and with heavy manuring, is only made to produce 17 tons of common turnips an acre?

The only conclusion I can arrive at is, that the fault rests not with the land, or the quantity of food supplied to the plant, but to defective culture, the absence of the observant mind that directs the husbandry at Lois Weedon. And I shall be glad if any of your readers can assign other reasons why the practical Yorkshire farmer cuts so low a figure amongst the turnip growers of the United Kingdom.

I am, sir, yours,

Jan. 26, 1853.

CRITIC.

THE MOLE A SUB-CULTIVATOR.—Even your tiny mole is a ruthless beast of the field, to slogs, and snails, and caterpillars, and such land-sucking fry, a fierce sub-navigator, in his way; but his track turns up some pretty cultivation; it only wants spreading, far and wide. It is not so wise to throttle him as you think. I grieve to see him hanging gibbeted, his claver paddles stopped by cruel ignorance. For he is your only granulation-matter; he taught us drainage, and sub-cultivation, and we shall learn of him another and a greater lesson some day, and call him a prophet when we've done hanging him, and have got some speculation in our own eyes, whose sense is shut at present, instead of saying *he can't see*.—*Talpa; or the Chronicles of a Clay Farm.*

## THE COCHIN-CHINA MANIA.

SIR,—Every few years an exaggerative idea of the profit to be gained by, and the essential value of, some particular plant, animal, or mode of culture seizes on the public mind, and remains there till drawn out by some still more extravagant whim. And among these manias and panaceas few have been more ridiculous than the exaggerated value set upon poultry in general, and the enormous prices at present given for a breed of fowls neither excelling in flavour, hardy, nor beautiful, and in which this folly is exaggerated in valuing the species not for size, early maturity, or egg productiveness (in which they excel), but from slight differences in plumage, shape of comb, and feathered or naked legs, as ridiculous a system as that of valuing rabbits by the length of their ears, or pigeons by the spread of their tails, modes by which their owners ought rather, perhaps, to be valued.

Farmers are not mere "farmers" either of birds or beasts; and, though high prices are given for animals of an improved breed, it is because they possess, or are supposed to possess, some real and intrinsic superiority, and have cost the improvers or importers considerable trouble and expense.

The introduction of new or superior kinds of domestic animals from foreign countries is indeed a matter of much importance, and, if carried out in a systematic manner, might lead to great benefit to the country, as well as profit to the importer.

Why should Cochin-China fowls monopolize all our efforts? And if they are of so much importance, no doubt great numbers superior to most that have yet been imported might be obtained from the Cochin-Chinese at very low rates, and would turn out a good investment if even half the present quoted prices were obtained in England. It is very likely, however, that the breed may soon degenerate in this country, and thus a constant import be necessary, if not profitable.

With regard to other animals. Why should the Australian kangaroo and the American llama be confined to menageries, and not be found occasionally in our pastures? In Texas (if Brother Jonathan be not hoaving us with a "reglar screamer"), it seems there is a kind of rabbit, called, from its size, the "jackass rabbit," often weighing as much as 50lbs.

The passenger pigeon of America is a very large and well-flavoured variety, it being 16 inches long, and 24 inches in the spread of its wings; its hue chiefly slate colour. They migrate in millions, feed on acorns and beech-mast: their most frequented roosting-places are covered to the depth of several inches with their dung over thousands of acres, all the trees being killed, and nothing growing for years afterwards (what a good substitute for guano if it could be brought to us cheaply enough). In their breeding-places, herds of hogs are fed on the young pigeons or squabs, which are also melted down as a substitute for butter or lard. The

falling a single tree often produces 200 squabs, nearly as large as the old ones, and almost one mass of fat. When the flocks of full-grown pigeons enter a district, clap nets and guns are in great requisition, and waggon-loads of pigeons are poured into the towns, and sold at 50, 25, and even 12 cents per dozen. This makes the highest price about 2d., and the lowest 0½d. each. Why could not this large pigeon, whose migratory habits are principally caused by search for food, be introduced into this country as a tame variety, or by crossing with our native breeds enlarge the size? or in the same way as fresh mutton was sent from Australia, be sent in casks potted in their own fat, to supply us with cheap pigeon pies.

And the same with a cross with the large Texan rabbit, or the wild American turkey, the latter being far superior in size and appearance to its degenerate descendant, the tame turkey being sometimes 4ft. in length, and 5ft. from wing to wing.

The canvas-back ducks of America are there boasted of exceedingly as a delicacy, yet although a great variety of useless water-fowl have been introduced merely as an ornament to the ponds and streams of our gentry, no attempt has been made to bring this kind to our farm-yards and tables; and even if it was found impossible to tame the pure breed, a cross with our own might be effected.

In the capercazie, or cock of the wood, a bird of the grouse species, but nearly as large as a turkey, once indigenous to Scotland, but now only found in the north of Europe, and in the bustard, the largest European land-bird, the cock weighing from 25 to 27lbs., we have examples of two fowls well worth the trial of domesticating by the amateur or intelligent agriculturist, a trial which, if successful, would probably repay quite as well as competition about the colour of a feather, or the shortness of a tail, and in time would be the means of affording a constant, certain, and moderately-priced supply, which is never the case while animals remain in a wild or half-wild state. W.

Jan. 28.

## POULTRY.

SIR,—Having long paid considerable attention to the selection and management of poultry, I am glad to find that your valuable columns show evidence of the interest you take in the improvement of their various breeds.

Your remarks, in your impression of the 17th, on the quality of the Cochin China breed, when put in comparison with the dunghill breed, having a slight tendency to convey an erroneous idea of the former breed, I would beg to add a few sentences on the subject.

The superiority of the Cochin Chinas over all others with which we are acquainted, for the production of eggs from October to March (when eggs are most re-

quired, and dearest from their scarcity) is now so universally allowed, that no further proof is required. So far as the "dunghill breed being able to fatten where Cochins will starve," the reverse is the fact, if hardness be our guide; for neither cold nor rain affects them to anything like the same extent. They are therefore, of all breeds, the most easy to rear. Their quietness of disposition not coinciding with the character of "foragers," your remark thus considered meets with some qualification. With respect to the quality of their flesh, I cannot see how it is possible to find fault with it. The cockerels do not *look* so well on the table as Dorkings, but the pullets are so plump and fleshy that they cannot fail in pleasing every one. In the eye of a novice the Cochins may be an unsightly bird; but if you, Mr. Editor, wish to enjoy the luxury of a new-laid egg, you need only keep a few couples of these birds (this is easy to do, as they can be shut into any corner, with nothing more than a piece of wire netting about three feet high), when that unsightliness which you complain of will go off, and then they will grow into "pets," so much will your matured eye admire them.

I am, very respectfully,

WM. TROTTER.

P.S.—In your paper, which has just come to hand, I find a few short extracts taken from my essay, in the *Royal Agricultural Society's Journal*, "On the Rearing and Management of Poultry."

*Healy Mill, near Hexham, Jan. 21.*

SIR,—It is a great pity that your correspondent "W.," whose letter on the Cochins mania appeared in last week's *Express*, should not have taken the trouble to form some slight acquaintance with the matter concerning which he discoursed, and by writing about a subject of which he knows nothing, bringing ridicule on a really useful suggestion.

The upshot of "W.'s" letter is, that it would be much better for persons afflicted with the poultry mania, instead of contenting themselves with criticising the shape of a comb or the colour of a feather, to endeavour to add new and useful species to our farmyards, and consequently to our dinner tables. So far I cordially agree with him, but he has been singularly unfortunate in the application of his theory.

The first three paragraphs of his letter are as much distinguished by good common sense as the remainder are by the reverse. This I hope to show:—

1. Cochins China fowls do not monopolize all our efforts. Witness the prize lists at the late Baker-street Show; and those who are conversant with the matter entertain a great doubt whether the Cochins Chinese possess fowls superior to those which have been imported; and also whether those we now have will degenerate, provided that proper care be taken of them.

2. *De gustibus non est disputandum*; and kangaroo meat may be even palatable to those who can get mutton, and a dainty dish to those who cannot; but, sir, why, in the name of common sense, should we import from our antipodes animals which would require fences twelve

feet high to control their spring-heeled propensities, when we have already those which are easily restrained by hurdles of a quarter that height, and then find we have not been gainers by the transaction? The chief value of the Llama is as a beast of burthen and a wool-bearer; its flesh is coarse and stringy. I cannot, therefore, conceive that any advantage could arise from domesticating it in this country. As to the "Jackass rabbit," I am not going to say that it does not exist; but, though I never heard of it, I hope sincerely it may, and be of use to our transatlantic cousins, and, through them, to us; but if "W." is so anxious to increase the size of our rabbits by crossing them with another species, why should he not begin at home, by trying to obtain some hybrids with the hare? And when he has succeeded in rearing a mixed breed, by all means let him try the Texan rabbit, and charter a steamer—it had better be the Great Britain—to bring it home in.

The next time "W." is in London, let him go to the Zoological Gardens, and ask to be shown the Passenger Pigeon, he will see a bird about half as bulky as a "blue rock;" and I think he will then be forced to admit that this bird is not likely "by crossing with our native breeds to increase their size." "W." is not apparently aware that ornithologists in measuring the length of a bird include the tail, and one bird may have that member longer than another. "W." is also wrong in supposing that its dung would be a good substitute for guano (although undoubtedly pigeon's muck is good manure), the chief value of which consists in its being the excrement of fish-eating birds.

"W." is in error again when he states that the American wild turkey is superior in size to our tame ones; were he to make a tour in Cambridgeshire and Norfolk, and use his eyes, he would see in dozens of rick-yards young turkey-cocks which, in point of size, would "tarnally whip" the largest gobbler that ever strutted in a Pennsylvanian savannah.

The canvass-backed ducks of America are much allied to our English dun-bird or pochar; and when "W." has learnt to domesticate that species, then let him attempt the canvass-back, but by all means have the particular seaweed they feed on sent over with them, or they will not be worth cooking.

The capercaillie requires a pine-forest to thrive in (although it has bred in confinement), and the bustard a desert. Nothing would rejoice me more than to hear that those noble birds (both once indigenous to Great Britain) were domesticated; but I think any one who knows their habits would allow that it would be impossible; and the flesh of both is dry and unpalatable.

No doubt some additions might be made to the fauna of the farm. The Eland (*Boselaphus orcas*) seems, in the hands of the Zoological Society of London, to be likely at some future day to prove of use: its docility, great size, tendency to fat, and savoury venison, all give promise that it may eventually be serviceable to the farmer. And among birds there are the crowned and white-fleshed pigeons (*Goura Victoria* and *G. coronata*, and *Leucosarcia pictata*), the Impeyan and fire-backed pheasants (*Lophophorus Impeyanus* and *Euplocomus*

*ignitus*), any of the Curassows (*Crax* —), and the Cereopsis goos ( *Cereopsis N. Hollandie*), which may, possibly, some day inhabit our poultry-yards.

If "W." will endeavour to propagate these and some nearly allied species, he will confer a great benefit on the community at large, and in particular upon

Feb. 4th, 1853.

A CONSTANT READER.

A correspondent of the *Leicester Journal* who signs "Thorough bred Game," addresses the ladies patronising the Sparkenhoe Farmers' Club as follows—

"I lived some years ago in the south of England, and there had an opportunity of watching a neighbour's management of her poultry. The farm she occupied might number about one hundred and sixty acres, and the clear profit she realized from her geese, turkeys, ducks, and fowls (principally from the latter, though) averaged £40 per annum. There was no allowance made, however, for her time, which occupied at least four hours a day. Now do you think this sufficient pay? If you take up any work on poultry, you will find the authors will show you double and treble profits on a farm of the size I have mentioned, and when you come to try their plans you will find they have deceived you. This person's skill was great, her fowls had almost the whole of her attention, and, moreover, she had a very good market; and, from my own experience, I think you will seldom make as much as she did. I must tell you a little of her system. The places for the hens to lay in were not confined to the place in which they roosted (a dirty plan), but were in the most convenient and retired holes and corners of the farm yards. Her plan was not to remove the new laid eggs every day, but to leave a considerable number in the nest. You have no doubt noticed your hens prefer laying to a number of eggs rather than to a single one. Nature teaches them that they are making preparations day by day for the reproduction of their species, and they feel more comfortable when the eggs increase in number. As the hens hatched they were taken as far as possible from their general walks. You will always find the chicks will grow as fast again in a fresh place, where there has been no poultry previously; they get worms, grubs, insects, and fresh grass, the supply of which is exhausted by the older birds at home; and whenever a quantity or number of fowls are together, the ground becomes stench, and the air impure. The pens are moved twice a day to keep the hens clean. The chickens have their liberty by going in and out through the bars, and are fed for the first four or five days every hour on crumbs, oatmeal, barley meal, grits, hemp seed, or linseed, in small quantities; but ground oats (not oatmeal) was the favourite food, not only for the chickens, but for the whole of the fowls; it is more wholesome than barley, and also much cheaper; and they were supplied with an abundance of clean fresh water, which is very necessary to their well-doing. This person, or her daughter, always looked after her own fowls, and if you want yours to pay, you must do so too.

"When I alluded above to the profits, I meant what you would generally make. At the present time, if you are fortunate enough to have one of the fancy breeds, you will, without doubt, make much more. For instance, one of the most eminent of the present fowl fanciers is the owner of some lauded property, and he intrusts his stock to the keeping of his

tenant's daughters, and pays them for their time and attention, receiving the eggs and fowls when ready for sale. This season he has paid them £150. What profit he has made I do not know, but it must be something considerable, for he was so well satisfied that he gave each of his managers a new dress. This gentleman sold a hen, at the late show in Baker-street, London, for £16. These high prices cannot last, so pray don't calculate on anything of the kind; the rage will subside in a time, and then if the possessors of these high-priced birds are left with a really useful breed on their hands, they may consider themselves very fortunate indeed.

"As to the best breeds to keep, if you can combine beauty of plumage and elegance of form with profit, so much the better. I set my face entirely against the fashionable Cochins. I believe there were 212 pens of them at the last Birmingham show, and an endless number at the Baker-street. I prophesy we shall not see so many of them another year. People have been led away by their great size and altogether extraordinary appearance. These are the reasons which I have for not liking them:—They are neither useful, profitable, nor ornamental. Not useful, because they do not come early to maturity, and as fat chickens they will not bear a comparison with the Dorking, which are sent to market at two months old. When full grown, though capable of being made very fat, they are inferior in delicacy and flavour to every other breed. Not profitable, because they will neither get fat nor lay a large number of eggs without expensive keeping, for they are great eaters, and have no idea of catering for themselves. When allowed their liberty, and a good range, they will not avail themselves of it, but will remain poking about home, which may be accounted for by their coming from a warmer climate. Not ornamental; this may be a matter of taste, but for my part I cannot like these great awkward, gawky birds, with a crow as hoarse and discordant as a raven's cry, with plumage not gawdy, but blotched with red and yellow.

"They are recommended as extraordinary layers, occasionally laying two a day, and their eggs being very rich. You must remember, though, they will not do this unless very highly fed; or in other words, if you lay out eighteen-pence in food, they will produce you a shilling's worth of eggs; and I must admit that no bird so soon shows good management and feeding. I was invited to see a lady's stock of Cochins last summer, and found them very dirty, their places not smelling over sweet, and their food being boiled potatoes. I went to see them again a few days before the Birmingham show, and found them so much improved I should not have known them for the same fowls. The poultry house was also very clean and sweet. On complimenting the attendant on the improvement, 'Ah!' said he, 'I feed them now regularly and abundantly three times a day on Indian corn, oats, barley, &c., &c.' Some of these birds were shown at Birmingham, and, if I had been a judge, would certainly have awarded them a prize.

"I had a friend with me yesterday, who has been in China for the last six or seven years. He was speaking of these birds, and saying how exceedingly fat the natives make them, so fat (an inch thick on the breast) that it had given him quite a dislike to eating fowls at all. Rice was the food they were kept on.

"From the number of breeds now brought prominently forward at the poultry shows, I select three as being most profitable, and equally good in their respective qualities. To expatiate upon these would make the present paper too long, so will conclude."

## THE POULTRY YARD.

We hear a great deal of talk about the money which is sometimes paid for eggs of choice kinds of poultry for the purpose of incubation, and intend very soon to join the hue-and-cry and talk about it too; but, when we consider the ease with which *productive* fowls might be procured and kept, the prices often given for new-laid eggs, for eating and domestic purposes, is a matter much more astonishing.

The attention of farmers has lately been repeatedly called to this subject, and some few are giving it the notice which it so much merits. Poultry is a kind of stock which fits in readily with other animals, consumes produce which would otherwise be wasted, requires little space, and yields a return during life, as well as when killed for the market.

The kind of fowl best adapted to the purposes of those who wish to supply the markets is a much disputed question; but, without losing a season in lengthened deliberation, it is easy temporarily to fix on the kind which *appears* best, and, while realizing from them, experiments on other kinds may be carried on at small expense and trouble.

The Spanish fowl lays an egg more magnificent in size than that of any other kind of fowl; these eggs have been known to weigh as much as four ounces, while those which usually supply our markets are from two to two-and-a-half. It may be worthy the consideration of those who collect eggs for the market whether eggs sell better for exceeding the usual size, and worthy the consideration of the housekeeper whether such eggs are better for domestic purposes. It has been affirmed by one of our best judges that there is so much less richness in the Spanish fowl's egg than in that of the Cochín-China, that two eggs of the last would make as good a custard as three of the first. There is great difference of opinion about the laying properties of the Spanish fowls; some persons find them excellent layers, while many complain that, although their eggs are very large, the number which they lay is very small. The Spanish fowl's egg is thick in form, and the shell is white.

The Dorking also lays a fine large egg, but her character as a layer varies greatly in different localities; these fowls, like the Spanish, are sometimes complained of as indifferent layers, and sometimes praised for being very good in that particular. The eggs are white and good in flavour.

The Cochín-China fowls lay a great number of eggs, and have one good quality which would tell well in the hands of persons anxious to have a regular supply for the markets; they do not, like most kinds of fowls, leave us without eggs for months together during the winter, but the supply from them is almost as good then as at other seasons of the year; winter is a time when eggs will always realize a good price. The Cochín-China eggs

are of medium size, being larger than those of the game fowl, and smaller than the Spanish, about as large as those which usually supply the markets. Those Cochín-China hens which may be considered the best layers, will resort to the nest and deposit an egg daily, with uninterrupted regularity, for many weeks together. These *best layers* are distinguished from those which are subject to the freak of nature of laying two eggs in one day, for which unusual activity the owners often have no reason to be grateful. There are few persons who keep Cochín-China fowls who do not meet with instances of this unnatural fecundity, but it is generally at the expense either of regularity in the supply—or of a perfected eggshell—or of fertility in the egg. Soft eggs are often dropped without interrupting the daily laying. The Cochín-China eggs are particularly delicate and fine in flavour. The shell is more deeply tinted than that of any other kind of fowl, being variously tinged with shades of buff and chocolate, and sometimes tattered over with chalky-looking specks which give it a peculiarly delicate, pearl-like appearance. The chocolate tint is more admired than the yellow. As this colouring in the eggshell is peculiar to the breed a *depth* of shade is valued by connoisseurs, but it is not imperative; for perfectly true bred fowls, imported fowls as well as those which have been bred here, will sometimes lay eggs not very much more coloured than those of the game fowl, and even the same hen will lay eggs of different shades.

In beauty of form and plumage there are few fowls which excel the game fowl; their quarrelsome disposition, however (although exaggerated by some authors), exists in a sufficient degree to render keeping a number together troublesome and even dangerous to themselves. In producing fowls for the table these would be less profitable than larger sorts, as giving less weight of meat, but the chickens are very delicious in flavour, as are also the eggs. The egg is rather small, with a tinted shell.

The families which now go under the name of Hamburgs are considered good layers. These are the fowls among which the decision of the farmer is most likely to hesitate; but whatever breed may be fixed on, let it be *kept pure*, and with cleanliness and *abundant feeding*, perhaps there is no kind which would not make an ample return. Although, perhaps, *no fowls* match the Cochín-China in the number of eggs which they lay, most are pretty good layers, if well cared for, and abundantly fed. Where food has to be purchased, and a large supply of eggs is desired, it is the best economy to buy the best corn and meal, and to give the fowls as much as they can eat. When the owner possesses refuse corn for which he can find no ready market, the case is different, and a little waste does not matter, as it would do if the food were paid for.—The Field.

## REPORT ON WHEAT, INDIAN CORN, AND OTHER GRAIN. FROM THE MEDITERRANEAN AND BLACK SEAS.

BY A. MONGREDIEN.

In taking a review of the foreign corn trade for the last few years, and comparing the present sources of supply with those we have habitually considered as the natural purveyors of food to England, we are struck with the change that has taken place. America and the Baltic were formerly looked upon as our granaries in times of dearth. They are now totally inadequate to meet our requirements, even in ordinary seasons. Their yearly surplus falls short of our yearly wants. It is from the fertile districts which border the Mediterranean and Black Seas that we now derive not only our largest and most regular supplies, but also the most copious and earliest relief when suffering from a deficient harvest. The hiatus caused by the diseased potatoes and the mildewed wheat of last season would have cost this nation many millions more than will now be required, were it not for the previously organized trade between England and the ports of the Black Sea, by means of which our increased demand will be met without that extravagant enhancement of prices, freights, &c., which would otherwise have taken place. The total quantity of grain (wheat, Indian corn, &c.) imported from foreign parts in the year 1852 was 6,750,000 qrs., of which no less than 3,350,000 qrs.\* were supplied from ports in the Mediterranean and Black Seas; and it is probable that the relative quantities during the present year will exhibit still more forcibly the importance of that branch of the grain trade which forms the subject of the present report.

The potato disease appears last season to have been far more virulent in England than in Ireland. Indeed in some parts of Great Britain, so great has been the devastation, that the farmers, who have so many other uses to which to turn their land, are disinclined to devote much space to so precarious a crop, and the culture of that esculent in England will certainly be on a diminished scale this year. Even in Ireland, where the ravages of the disease have been less considerable, there appears,

\* The above quantities include all kinds of grain and pulse, but not meal and flour. The 3,350,000 qrs. consist of the following items:—

Wheat .....	qrs. 1,700,000
Barley .....	" 150,000
Rye .....	" 8,000
Beans .....	" 240,000
Maize .....	" 1,250,000

Qrs. 3,348,000

Taking the article of wheat separately, we find the total imports in 1852 to have been about 3,200,000 qrs., of which 1,700,000, or more than half, were from ports in the Mediterranean and Black Seas. In 1841, the total imports of wheat into the United Kingdom were 2,400,000 qrs., of which only 230,000, or one-tenth, were from Russia, Italy, Turkey, &c., and the nine-tenths were from Denmark, Prussia, Germany, Holland, France, America, &c. At that period, maize was hardly known as an article of import. For the last few years the annual quantity imported from places within the Straits of Gibraltar falls little short of a million and a half quarters.

from the numerous opinions I have received on the subject, to be a growing indifference to potato cultivation on a large scale; and the area devoted to it next season would have been still more contracted, had the incessant rains not partially prevented farmers from sowing their land with cereals. Agriculture in Ireland is undergoing a decided change; Irish farmers are more and more throwing off the yoke of routine, and enlisting under the banners of experience. They find that their soil and climate are comparatively ungenial to the growth of wheat, and accordingly every year less is sown. On the other hand, flax in the north, and oats everywhere, generally yield abundant and remunerating crops, and will be extensively cultivated.

From almost every quarter I have received the most gratifying reports as to the prosperity of the labouring classes. My inquiries were couched in the following shape: "Has the prosperity of the lower classes induced them to use articles of food different from those they formerly consumed? If so, what articles will be chiefly affected?" From Ireland, with the exception of the neighbourhood of Youghal, the answers were of a decidedly favourable character. There was more demand for labour, with higher wages, less pauperism, and better feeding than had been known for years. It might have been inferred that with increased prosperity, and with potatoes too dear for the masses (except in the vicinity of Galway and Westport), the consumption of Indian meal would be large and general. But it is not so. With increased resources, the masses have acquired a taste for a higher diet, and both oatmeal and wheaten bread are now used by many of the previous consumers of Indian corn. In spite of their diminished numbers, the expenditure of the Irish population for food is probably as great as before, only it is food of better quality, and more in quantity per head.

Whether the still advancing price of wheat may drive the masses back again on the consumption of Indian corn remains to be seen; but at present that article meets with severer competition from flour and oatmeal than it did heretofore from potatoes and turnips.

But, although the present rate of consumption of Indian corn in Ireland is, according to all accounts, not equal to that of last year at the same period, yet we find that the quantity consumed throughout the year 1852 was about the same as in 1851. The total importation in 1852 amounted to 1,550,000 qrs., to which, if we add the stock on hand at the commencement of that year, viz., 444,200 qrs., and deduct that remaining on the 31st December of 428,000 qrs., it will follow that the quantity that went into actual consumption in 1852 was 1,566,200 qrs., which is very little short of that for 1851, which amounted to 1,620,000 qrs.

The following is a statement of the stocks of Indian corn at the principal depôts in Ireland, with the addition, for the sake of comparison, of the stock in the same places at the correlative period last year.

Stock of Indian Corn at	On Jan. 1, 1853.	On Jan. 1, 1852.
Dublin.....	Qrs. 21,000	10,000
Wexford and vicinity.....	" 7,000	6,700
Waterford and vicinity.....	" 78,000	42,000
Youghal and vicinity.....	" 9,000	7,000
Cork.....	" 65,000	60,000
Tralee and vicinity.....	" 10,000	12,000
Limerick and vicinity.....	" 18,000	30,000
Galway.....	" 20,000	16,000
Westport and vicinity.....	" 8,000	4,000
Sligo and vicinity.....	" 20,000	15,000
Londonderry and vicinity.....	" 38,000	44,500
Belfast and vicinity.....	" 29,000	60,000
Newry.....	" 25,000	25,600
Drogheda and vicinity.....	" 5,000	18,000
	Qrs. 353,000	350,200
Other places in Ireland.....	" 50,000	50,000
	403,000	400,200
At Liverpool and Glasgow....	" 25,000	41,000
	Qrs. 428,000	444,200

The aggregate stock appears, therefore, very much the same as last year; and in the distribution the chief alteration seems to be that at Waterford the stock is this year larger by 36,000 qrs., and that at Belfast it is, by about the same quantity, smaller. It is worthy of remark, that, whilst the supply received at Limerick this year is barely two-thirds of that of 1851, yet the stock at that port and its vicinity is only reduced by 12,000 qrs., showing very clearly that Indian corn is much less used in that district than in former years.

The imports from all parts in 1852 amounted to 1,550,000 qrs., of which about 1,100,000 qrs. arrived in vessels from the Mediterranean, &c., calling at Queenstown or Falmouth for orders. The balance consists of imports from America, France, Portugal, &c., and also of cargoes addressed direct to a port of discharge without first calling off the coast for orders. I subjoin a statement, showing of what descriptions of corn, and of what quantities of each, the 1,100,000 qrs., before referred to, consist:—

Received in 1852 from	Vessels	Qrs.	Received in 1851	Qrs.
Galatz.....	in 176..	223,000,	in 212 vessels..	286,067
Ibraila.....	in 259..	362,600,	in 129 ..	201,779
Salonica.....	in 27..	35,640,	in 63 ..	95,377
Odessa.....	in 101..	219,170,	in 47 ..	74,065
Egyptian.....	in 35..	50,960,	in 54 ..	86,260
Italy.....	in 8..	8,250,	in 131 ..	162,544
Constantinople, Malta, Trieste and other ports in the Mediterranean	} in 110..	190,729,	in 211 ..	296,358
	716	1,090,340	847	1,202,450

It will be noticed that the falling off in the importation this year from Italy has been very considerable, viz. only 8,000 qrs. in 1852, against 162,000 furnished us in 1851. In fact, so deficient was the crop in Italy, that, instead of being an export country it received a considerable supply from the Black Sea. Salonica

and all the minor ports also exhibit a deficiency, which, however, is made up by the increased receipts from Odessa, Galatz and Ibraila, which furnished 805,000 qrs. in 1852, against 562,000 in 1851.

How the 716 cargoes of maize that arrived off the coast in 1852 were distributed will be seen by the following statement, which also exhibits the number of cargoes received at the same places during the year 1851.

Cargoes discharged at	In 1852.	In 1851.
Cork.....	96	62
Waterford.....	92	87
Londonderry.....	73	121
Limerick.....	64	102
Newry.....	59	35
Dublin.....	54	64
Belfast.....	41	81
Galway.....	35	33
Drogheda.....	20	36
Sligo.....	15	45
Tralee.....	13	25
Westport.....	12	27
Other Irish Ports.....	97	84
Liverpool.....	38	22
London, &c.....	7	23
	716	847

From the above it is apparent that there has been a diminished supply (probably owing to the diminished demand) to the northern and western, and an increase to the southern districts of Ireland.

The present price of Indian Corn is higher than it was this time last year, but the advance is but small compared with that which has taken place in Wheat and other bread stuffs. If the latter should continue to rise in value, as appears probable, Indian Corn can hardly fail to participate in the movement, though if it be true that the masses in Ireland have acquired a taste for wheat bread, which they can afford to indulge, the value of Indian Corn will not improve *pari passu* with that of wheat.

Last year, in making up the stocks of wheat in Ireland, I confined my attention to Polish Odessa, but this year the statement I subjoin comprises all descriptions of foreign wheat. The quantities existing in Irish ports consist almost exclusively of Polish Odessa, Ghirka, Danube and Egyptian wheats, and will be found, I believe, represented with tolerable accuracy in the following table:—

	Stock of Foreign Wheat on 1st January, 1853.
Dublin.....	Qrs. 22,000
Wexford, &c.....	" 7,000
Waterford, &c.....	" 8,000
Youghal, &c.....	" 3,000
Cork.....	" 30,000
Tralee, &c.....	" 12,000
Limerick, &c.....	" 25,000
Galway.....	" 8,000
Westport, &c.....	" 2,500
Sligo, &c.....	" 3,000
Londonderry, &c.....	" 17,000
Belfast, &c.....	" 10,000
Newry.....	" 8,000
Drogheda, &c.....	" 7,000
Other places in Ireland....	" 30,000
	Qrs. 198,500

Last year I ascertained that the stock of Polish Odessa wheat alone was 120,000 qrs.; so that, in proportion, 200,000 qrs. of all kinds, which is the present stock, is certainly very much smaller, whereas for the following reasons, there can be no doubt that the wants of Ireland will be much greater this year than last:—

1°. The population is smaller, it is true; but the bread-eaters are more numerous than they were.

2°. Very little wheat was grown in Ireland last season, and the stocks of native produce in farmers' hands are (as reported to me from almost every district) smaller than ever were known.

3°. The Irish millers are very nearly free, this season, from the much-dreaded competition of French flour, and will not only have the exclusive supply of their local customers, but may, probably, partially recover their command over some of the markets from which their French rivals had ousted them.

Indeed, nearly all the numerous parties who have replied to my queries on this point concur in the opinion that the Irish millers will, between this and next harvest, require a very large supply of foreign wheat.

But it is not only in Ireland that the demand will exceed the average importation, even of late years: throughout the whole of the United Kingdom, with the exception of those districts which are purely agricultural and least densely populated, foreign wheat will have to be extensively used, at all events, up to next harvest. In some localities the last crop is reported to have been an average in measured quantity, in others below it. But, almost everywhere, the weight, condition, and milling properties are stated to be very inferior; and even where the quantity still in farmers' hands is abundant, it cannot be used by the miller without an admixture of foreign. It behoves us, therefore, to inquire what stocks we have in hand, and what quantities we may expect to receive in the ordinary course of things. If these prove inadequate to our wants, we shall then have no alternative but to outbid our competitors in the food markets of the world, and to compel additional supplies by the temptation of higher prices.

The stocks of foreign wheat, held at the commencement of this year, in the principal ports of England and Scotland are, as nearly as I have been able to ascertain, as under. These returns cannot, I regret to say, be thoroughly relied on in all cases, as there is no organised system by which stocks can be ascertained. Of all places, London is the one in which, strange to say, there exists the greatest uncertainty as to the quantity of foreign wheat lying in granary. The estimate I have given is, probably, nearly correct; but it is, after all, merely the average of conjectures, given by the most competent persons:—

	Qrs.
London .....	350,000
Liverpool .....	150,000
Glasgow .....	98,000
Gloucester.....	65,000
Newcastle.....	30,000

	Qrs.
Hull and Goole.....	22,000
Bristol .....	15,000
Southampton .....	10,000
Other places in Great Britain ..	80,000
	<hr/>
In Ireland.....	320,000
	200,000
	<hr/>
	1,020,000

It appears then that, in round numbers, the stock of foreign wheat in the United Kingdom (of course exclusive of what is in the millers' hands) is a million of quarters. The ordinary annual importation of foreign wheat, taking as standards the years 1850, 1851, and 1852 (which produced good average crops) may now be fixed at about 3,500,000 qrs. What extra quantity will be required in 1853 it is quite impossible to compute, but that we shall want a larger supply than usual is beyond dispute. Forming, however, the most moderate estimate of our increased requirements, we cannot but be struck with the fact that the stock of foreign wheat bears a *very much* smaller proportion to its annual consumption, than do the stocks of sugar, cotton, or of any other article of similar consequence to the community. If we suppose, for instance, that we shall this year require a total importation of 6,000,000 qrs. of wheat, then our present stock is only equal to two months' consumption. There is no commodity of importance of which we place so small a store in reserve with which to meet emergencies. What would be the effect on cotton, if the stock were reduced to only two months' consumption?

The amount of the supplies of wheat which we derived last year from ports in the Mediterranean and Black Sea, was about 1,700,000 qrs., of which about 1,300,000 qrs. were by 687 vessels, which called at Queenstown or Falmouth for orders, and the remainder were shipped direct from port to port. The following is a classification of the different kinds of wheat of which the 1,300,000 qrs. consisted:—

	Qrs.	Vessels.
Odessa wheats, chiefly Polish, white and red, but including some cargoes of Odessa Ghirka and hard wheats .....	453,700	in 203
Ghirka wheats, shipped at Marianople, Berdianski, Taganrog, and ports in the Sea of Azov, including a few cargoes of hard wheat .....	336,050	171
Danube wheats from Galatz and Ibraila ..	85,000	76
Egyptian wheat .....	276,500	143
Roumelia wheat, chiefly shipped at Varna and Constantinople.....	27,650	16
Syrian wheat .....	7,000	6
Italian wheat .....	30,500	27
Sundries, shipped at Constantinople, Marseilles, Malta, &c.; chiefly transshipments .....	68,000	45
	<hr/>	
	Qrs. 1,284,400	in 687

As compared with a similar statement given in my report of last year, the supply of every description of Mediterranean wheat appears considerably less than in 1851, with the exception of the Ghirka class of wheats, which this year exhibit an excess of 240,000 qrs., the



importation in 1851 having only been 97,000 qrs. The deficiency in the other sorts more than counterbalances this increase in Ghirka, the total quantity received by vessels calling for orders having in 1851 been 1,600,000 qrs. against about 1,300,000 last year.

Of the above 687 cargoes, 372 were discharged in Irish ports, 254 in English ports, and 61 were sent on to the continent. The following table exhibits the number of cargoes of each description that were sent on to each of the principal ports respectively :—

	Odessa.	Ghirka, Marianople, &c.	Dambs.	Egyptian.	Sundry.	TOTAL.
<b>IRELAND :</b>						
Dublin . . . .	8	21	11	13	13	66
Cork . . . . .	38	34	10	13	10	105
Limerick . . .	16	25	3	38	2	84
Londonderry .	1	1	2	9	—	13
Waterford . .	17	8	3	—	5	33
Belfast . . . .	8	1	1	6	6	22
Other ports . .	18	6	7	11	7	49
<b>GR. BRITAIN :</b>						
Gloucester . .	19	16	11	—	11	57
Bristol . . . .	17	14	2	—	1	34
London . . . .	23	36	7	14	8	88
Liverpool . . .	4	1	5	10	13	33
Glasgow . . . .	—	—	—	17	4	21
Other ports . .	9	4	3	—	5	21
<b>CONTINENT . .</b>						
	25	4	11	12	9	61
	203	171	76	143	94	687

The recent advance which has taken place in the price of wheat, and the general opinion that prevails as to our not having yet reached the culminating point, have of course stimulated the Mediterranean importers to increased exertions, and preparators have no doubt been made for shipments in spring to a larger extent than usual. It must be observed, however, that the quantity on the way is not large ; that shipments at this season from the Black Sea can be but few, even though the navigation be open ; that meanwhile prices have so advanced at most of the shipping ports, as to leave very little margin of profit to those operators who had not supplied themselves beforehand ; and that there is a positive scarcity of ships even at enhanced freights, which interposes a physical obstacle to the transmission of the grain to this country, except gradually and at increased cost. I do not, therefore, expect that the importations from that quarter will, during the first three or four months of the present year, be much larger than during the corresponding period in 1852. After that, they will probably become more abundant ; still I do not expect (unless under the influence of a heavy rise in price) that the total supplies from the Mediterranean and Black Sea will in 1853 reach a higher figure than 2,000,000 qrs.

From France very little can be expected, as compared with previous years. The advance in prices here has been met by a corresponding advance there, and it

is the opinion of those best qualified to judge, that the produce of the French fields last season is but barely sufficient for local wants.

What we may expect to obtain from the Baltic and from America beyond the regular annual supplies from those quarters is entirely a question of price. It must be borne in mind that there is not the same inducement for parties abroad to hold stock under free trade as under the sliding scale. As enormous profits were then sometimes (although at distant intervals and in but few cases) realised by operations in wheat, they offered to sanguine speculators the temptations of a lottery, and large quantities of wheat were stored up in various places to profit by the contingency of an English dearth, and the consequent sudden rush for wheat from any place and at any price. Free trade has destroyed these chances, and with them one of the inducements to hoard up stocks. It is now pretty well ascertained what the normal requirements for England will, on the average, take off each season from each place. Provision is made for that quantity, and no irregular accumulations take place with a view to an irregular demand. When, therefore, we seek to draw more largely than usual from America and the Baltic, we must expect to pay for the accommodation we receive, and the inconvenience we occasion by such additional supplies ; and even then these supplies will be far from inexhaustible. It is a fallacious idea that when prices attain a certain point America can swamp us with breadstuffs. At that certain point (whatever it may be) a moderate quantity of wheat will be sent forward ; but, stocks being light in America, a small export will buoy prices up, and a fresh rise must take place here before another moderate supply will be despatched, and so prices will continue to advance as stocks decrease, till it will be found that they have reached, not a " certain point," but a very high level before a very large quantity is sent forward.

If it be true that the extent of our receipts from abroad will depend on prices, then it is also true that prices will depend on the extent of our requirements. What they will be no one knows, and no one has any means of ascertaining. Not only are we ignorant of the total yield of last year's crop, but we do not even know how much wheat we grow yearly on an average. If we could, by some extraordinary effort, be made aware of the exact number of quarters of wheat, of 480lbs. each, produced in the United Kingdom in the course of 1852, even then the knowledge would be useless ; for we are ignorant of the number of quarters we annually consume, and could not therefore ascertain the quantity we require to import from abroad. Some wild guesses have been made, and on them some crude theories have been founded. But a subject of such vital importance should surely not be left in a state of profound obscurity. It is the duty of Government to do that which, whilst of great national importance, it is beyond the power of individual enterprise to effect. With very little trouble and expense, it might be ascertained each year what was the

acreage devoted to the cultivation of wheat, and what the average yield per acre in weight. At present we have persons employed in ascertaining and publishing the average prices of different kinds of English grain in a great variety of places, whose labours as to prices are perfectly useless since the abolition of the sliding scale, and whose returns as regards the quantities sold are worse than useless, since, being essentially and necessarily erroneous, they are only calculated to mislead. It would be very desirable if their labours could be directed into the more useful channel pointed out above.

It is, after all, to the Black Sea and to the eastern shores of the Mediterranean that we must chiefly look for the cheap and adequate supply of our annually increasing demand for foreign grain. The eastern seaboard of America is now too densely populated to spare us much, and will yearly be less able to spare us any. The capabilities of supply on the part of the Baltic ports have long since reached their utmost development. But from the vast and fertile plains of Southern Russia and the rich valley of the Danube the supply is susceptible of almost indefinite extension, and for many generations our requirements, however they may increase, will be met by enormously elastic powers of production. Every year more land is being there brought into cultivation, and, stimulated by the easy and profitable outlet which our markets afford, landowners will proceed in their career of improvement. The system of selling cargoes for cost, freight, and insurance has, however, powerfully contributed to this result. If the importer could not have realised his grain till it arrived in England, and then only in broken parcels, his operations would necessarily have been much restricted. This mode of selling has now been tried for some years, and has been found fully to answer the purposes of all parties.

It may not be uninteresting to point out that this large and increasing trade is exclusively in the hands of a small body of merchants, all connected together by the ties of nationality, of religion, and in a great measure of kindred. They created this cargo trade, and they probably will keep it to themselves. The history, progress, and position of that small but powerful commercial phalanx, the Greek merchants, present most remarkable features. In 1820, the trade with the Levant, then of small extent, was wholly in the hands of British merchants. In that year, two or three Greek houses were established in London, with moderate capitals and humble pretensions. Their operations, though at first limited, were highly successful, and received rapid development. Other Greek establishments were formed, and gradually the whole of the trade passed away from the British houses into the hands of the Greeks, who realized rapid, and in many instances colossal, fortunes. The trade, which formerly was confined chiefly to the districts to which Constantinople and Smyrna form the outlets, has now extended to the valley of the Danube, to the shores of the Black Sea, to Persia, to the vast provinces of which Aleppo and Damascus are the chief marts, to Egypt, whose powers of production and consumption have only recently been stimulated into activity, and has through the enterprise, activity, and sagacity of the Greek merchants, penetrated into distant and semi-barbarian

regions, where Manchester fabrics were before as unknown as the very name itself of England. The number of Greek firms engaged in this trade, and established in England, has increased from 5 in 1822 to about 200 in 1852. The imports and exports from and to the districts, whose trade is conducted by the Greeks, amounted in 1822 to a mere trifle, whereas they have now attained a magnitude which, in the scale of our dealings with foreign nations, gives that trade the third or fourth rank. A calculation has been made that the aggregate trading capital of all the Greek houses established here in 1822 could not much have exceeded £50,000. There is now a single Greek firm whose yearly income is known to be more than four-fold that amount; and as to the aggregate capital now invested by the Greek merchants in their gigantic operations, though the precise number of millions it may be difficult to fix, yet this much is certain, that many houses have large sums lying unemployed, that the field of their enterprise, large as it is, is inadequate to absorb their resources, and that branch houses are daily being founded by the Greeks in distant countries—in North and South America, in India, in Russia, &c., in order to utilize their redundant capital. It is only since 1846 that the English corn trade has attracted the attention of the Greeks. As long as the extreme fluctuations in prices incidental to the sliding scale alternately enriched and ruined foreign importers, the Greeks were far too prudent to engage in so dangerous a trade; but when operations in foreign corn were freed by Sir Robert Peel from fiscal influences, and brought within the natural conditions of legitimate commercial enterprise, the Greeks embarked with their usual energy into the trade. With exceptions too insignificant to notice, all the grain imported into the United Kingdom from the Mediterranean passes through their hands.\*

It may fairly be questioned whether the system of dealing in cargoes on passage (or still in process of loading) could have been carried out to its present extent, or in its present shape, had the importers been a mixed instead of a compact and homogeneous body like the Greeks. The yearly amount of transactions in this branch of the grain trade is very considerable. On a rough calculation it is estimated at £1,000,000 per annum, and the total, since its opening seven years ago, at little short of £30,000,000. The admirable manner in which so complex a system works, reflects equal credit on buyers and sellers. Notwithstanding the necessarily intricate nature of the transactions, the risks and nice questions they involve, and the reliance they necessitate on the *bona fides* of both parties, litigation is unknown, and differences are always settled by either compromise or arbitration.†

\* The grain trade, however, forms but a comparatively small item in the general operations of the Greek merchants. Tallow, linseed, wool, &c., from the Black Sea; silk, opium, fruit, and a long list of other articles, from Turkey and Greece; cotton, &c., from Egypt, constitute, with grain, a large array of productions, which they import into England. But large as is the amount of their importations, it is exceeded by that of their exportation. Of these, the cotton manufactures of Manchester form the principal feature, and so extensive are the dealings of the Greek merchants in these articles, that whether the advices from Manchester shall be "flat" or "brisk" frequently depend on whether the "Greeks" are "in the market" or not.

† That some improvements might, however, be introduced, must be admitted. An understanding ought to be come to as to deficiency (and perhaps excess) in delivery. It would be well if the standard by which both sales and freights (especially the latter) are adjusted were to be weight instead of

Since the commencement of the present large dealings in Black Sea wheats, many additional descriptions have been introduced, and a trade has been opened with many new producing places. A few years ago red Polish Odessa wheat formed by far the largest bulk of our imports from that quarter; it now constitutes barely a third. Ghirka wheats from Marianople, Berdianski, Taganrog, and other places have last year been imported very largely, viz., about 350,000 quarters against 100,000 qrs. in 1851. This class of wheat is daily becoming better known amongst millers, whereas its use was once chiefly confined to Cork, Limerick, and the adjacent districts, it is now getting into general repute.

Danube wheats are also rapidly increasing in favour with the millers, and deservedly so, if they continue to maintain the same standard of quality which the shipments for some time past have established. They are cleaner than formerly, and arrive in better condition; and whereas in previous years their value in the market was considerably below that of Polish Odessa, they now rank higher, and obtain better prices.

Roumelia wheat has also improved, but not to the same extent, and its relative value remains very nearly as before.

The rise in Egyptian wheat has outstripped all expectations. In 1850 its price was 10s. to 12s. per qr. below that of Polish Odessa; in 1851 the distance between them decreased to 7s. to 8s. per qr.; at one period in 1852 it converged to within 3s. per qr., and the difference is now about 5s. per qr. It is true that considerable improvement has taken place in the intrinsic merits of Egyptian wheat, chiefly in respect to its cleanliness and freedom from adventitious substances. This, however, is not sufficient to account for its increased relative value, and it remains to be seen whether, after shipments take place more freely than they have for some time past, it will maintain its position.

Our receipts from Syria consist chiefly of hard wheats, which met with little favour from the millers, as long as they were sent us mixed with barley, straw, stones, and dust. Lately, however, the shipments have been much better in all respects, and there are some cargoes now on passage of beautiful quality and colour, and perfectly clean. If these, as is probable, realise a proportionately higher price, shippers will be induced to incur the labour and cost necessary to select, classify and cleanse the grain.

Some very fine shipments of both hard and soft wheat have been, and are being made from Salonica, a port hitherto chiefly known by its exports of Indian corn, but which, as the chief maritime outlet for the large and fertile province of Macedonia, is likely to supply us copiously with wheat, and also with barley and rye, both of which articles the district produces in great abundance, and of fine quality.

I may mention, as a proof of the activity of the Greek importers in discovering and availing themselves of new sources of supply, that, in addition to the already numerous ports from which shipments have customarily been made, cargoes of

grain are now on the way from, or are shipping at Bourgas, Anchialoa, Rodostov, Lanarka (in Cyprus), and several other places hitherto unknown in the annals of trade.

The imports of barley from the Mediterranean are on the increase, prices having reached that point when the cost of conveyance from so great a distance, although somewhat augmented, does not bear such a proportion to the gross value of the cargo as to absorb all margin of profit to the importer. In addition to the shipments direct from port to port, 74 cargoes have arrived during the year at Queenstown or Falmouth for orders, amounting to 121,000 qrs., against 82,000 qrs., in 43 cargoes, in 1851. Of these 74 cargoes, 23 were from Alexandria, 29 from Malta and Oran, 8 from Cyprus and Syria, 12 from Odessa and Salonica, and 2 from Smyrna. Of these London took off 23 cargoes, Glasgow and Leith 12, and the remainder were dispersed throughout various other places.

Of 65 cargoes of rye, which have arrived off the coast for orders during the past year, no less than 57 were destined for the continent, having either been originally ordered for that quarter, or attracted there by higher prices than our markets could afford. Lately, however, a demand has sprung up for this article from various parts of the United Kingdom, and 30s., cost, freight, and insurance, is now its current price. It is not likely that rye will become a permanent article of import, as it is only under the influence of exceptional circumstances that its value here can leave a margin to the importer. Of these 65 cargoes, 43 were from Odessa and the eastern ports of the Black Sea, and 14 from the Danube.

A large proportion of the beans received from the Mediterranean proceed direct to their port of discharge, without touching at Queenstown or Falmouth for orders, and considerable quantities find their way to Liverpool from Alexandria, forming portions of general cargoes. Still, 46 cargoes of Egyptian beans, containing 96,000 qrs. arrived off the coast in the course of 1852, of which 12 cargoes were ordered to London, 13 to Liverpool, 6 to Glasgow, and 8 to Hull and Goole.

I have refrained from offering any decided opinion as to the probable course of prices up to next harvest. It has been my endeavour to collect all the facts I could, and lay them before my friends, leaving them to draw their own inferences. It has also been my wish to guide millers, dealers, and importers in their appreciation of the relative values of the different descriptions of Mediterranean wheats, by pointing out which had gained and which had lost favour—which had risen and which had fallen in comparative value—which had increased and which had diminished in respect to the quantities obtainable of each—all matters important for practical men to know, so as accordingly to apportion their attention to the different kinds. For instance, Ibraila wheat, which, two years ago was considered much below the value of Polish Odessa, is now by many preferred to it. Fluctuations are every season occurring in the comparative intrinsic merits of different wheats, arising from local atmospheric, and other causes, and those who watch these mutations will possess a decided advantage over those who ignore them or undervalue their importance.

36, Mark Lane, Jan. 20, 1853.

measure. The two questions of commission and of interest on freight should be finally settled. These and some other points now open to doubt and discussion should be legislated upon by a committee appointed, jointly, by merchants and farmers.

## TO THE LANDOWNERS AND TENANT FARMERS OF ENGLAND.

GENTLEMEN,—I am tempted to address you on the position in which you, as an important class, stand at the present moment.

The late general election was unquestionably one in which the electors of Great Britain were appealed to on the important question of Free-trade *v.* Protection; and I regret, as much as any man, that only 310 members were sent to the House of Commons to uphold Protection to Native Industry. The result was, that Earl Derby, having stated before the dissolution of Parliament that he would abide by the voice of the people so expressed, did, in accordance with that declaration, give up his own opinion, and let, at any rate for the present, the question of Protection slumber.

The late Government were bound, in justice to that interest from which unquestionably they received their greatest support at the late general election, to recommend to Parliament measures which might atone and at the same time do an act of justice to the agricultural interest, and confer a great boon and benefit upon the working and producing classes of this country. As one deeply interested in this question, I am bound to say I did feel deeply grateful to the late Government for recommending a reduction of the malt duty, not only as an act of justice to us, but as a great boon to the labourers of England: I only regret they did not advise a total abolition of the duty, instead of a reduction, for the expensed of collecting would remain the same.

As it appears the question of Protection is to be permitted to sleep for the present—and many may deem it wise quietly to permit it to do so—yet I for one never will give up that which in my conscience I believe is best for the true and permanent interest of my country. I am still of opinion that the best policy of a highly-taxed country to adopt for the protection and encouragement of the labour of its people, is to levy an equivalent duty on all articles produced by foreign labour imported into that country, equal in amount to what the local burdens and general taxation enhance the cost of producing articles by native labour, skill, and capital. I have ever entertained this opinion; and every day's experience more fully convinces me that I am right. But if in this country we are to adopt "unrestricted competition" as our general policy, I say then let it be so in every sense of the word. But let me ask, is the present competition to which we are now exposed an unrestricted one? It is only on one side that it is so: I defy either Cobden or Bright, neither of whom will stand at trifles, to say that the agriculture of England is unrestricted.

We could grow tobacco, but the law will not permit us to do so.

We could make large quantities of sugar from our

beet roots; but restriction steps in, and will not permit the "unrestricted" use of our own produce.

Another article of our produce, used in making the national beverage of the people, barley, is compelled to pay a duty some years equal in amount to the market value of the raw material. This again cannot be called "unrestricted competition." In fact, nearly one fourth of the revenue is derived from duties imposed on corn produced by British capital, skill, and labour. Then, I say, this being the case, let us no longer press the Legislature for a duty on foreign produce (although I still believe it the wisest and best policy), but let us, in no mistakeable manner, go for justice; let us not go "whining to Parliament" to ask for Protection, but let us, with the bold front of injured men, demand justice from the Legislature of our country. Let us demand that we do have "unrestricted competition" in the full sense and meaning of the word.

What I would advise is, that the Committee of every agricultural society in the United Kingdom be immediately called together, and that a form of petition be drawn up, praying for a total repeal of the malt-tax: that a copy of such petition be sent to every parish in the county in which such society is situated; and that these petitions be signed by all the inhabitants, and every labourer, I am sure, will be most anxious to sign them: yes, all will do so who are desirous of having "unrestricted competition" in beer: that these petitions be divided between the county members, and the members for boroughs within such county; and that those got up in boroughs be not only presented to Parliament by the members of those boroughs, but that a deputation of the electors of each borough do request and urge upon their members the necessity of supporting such petitions. Let this be set about immediately; and if any parish is unconnected with an association, let some active person immediately draw up a petition on paper; let the prayer of it be as short as you please, but pray for the abolition of the malt and hop duty.

As one instance amongst many of the way in which the manufacturers are treated, in comparison with the farmers, I would mention the case of the manufacturers of woollen goods, who are allowed a drawback of the duty paid on the soap used in such manufacture; but myself, a tenant farmer, sending to be malted for my own use about 50 quarters of barley annually, cannot use this portion of my own produce in making a beverage which I give to my own labourers in their work, or in other words use in manufacturing or growing corn, until I pay the government in the shape of malt duty £54 3s. 4d. Call ye this "unrestricted competition?"

Again—If an able-bodied labourer marries, and applies to the secretary for emigration, he can be boarded

and lodged for 12 or 16 weeks for £2, with a free passage to Australia: and for what purpose? To execute some public work? No! To assist the farmers in that far distant colony in producing food for the people? No! But we are taxed to send these men, the very sinews and strength of Old England, to this land of gold, to seek for treasures, and all the beer they consume is free from duty; whilst those labourers who remain at home are compelled to submit to this oppression and unjust impost, and also largely contribute according to their incomes to the general revenue of the country. And it should be borne in mind, that the thousands and tens of thousands we are expending in sending the sinews and strength of our native land to those far distant treasure-bearing districts, increase in the same ratio as our population diminishes, the amount of taxation to be levied upon those who remain at home.

If an example of the result of untiring energy and zeal, directed to one sole object, were necessary to stimulate you to exertion in the cause of yourselves and your labourers, I need only draw your attention to the result of those few but energetic men who first advocated and ultimately obtained a repeal of those protective laws which the wisdom of our ancestors deemed necessary to protect the labour of our own people against the lightly-taxed labour of other lands.

We have justice on our side; and I cannot see how those men who advocated a repeal of the tax on the food of the people can for one moment object to or oppose the repeal of a tax on the necessary beverage of the people, especially when we find, on comparing the consumption of malt with the population of England and Wales for many years back, that the consumption has but slightly increased.

The average population of England and Wales from 1700 to 1750 was, 5,768,000; average consumption of malt during the same period was 26,365,460 bushels. Population 1841, 15,906,831; consumption of malt, same period, 33,067,324 bushels. Malt consumed per head from 1700 to 1750 was 4 bushels 2½ pecks; and that consumption we now find has been reduced to 2 bushels and a quarter of a peck per head in 1841.

Can those to whom the destinies of this mighty nation are entrusted think that we can tamely submit longer to allow such an act of oppression and injustice to exist?

I call upon you, then, to arouse yourselves; to be up and doing, and never cease to relax in your exertions until you obtain a total abolition of the malt and hop duties.

I remain, gentlemen, and brother farmers,

Your obedient servant,

Ichleton, Jan. 26, 1853.

SAMUEL JONAS.

## AGRICULTURAL EDUCATION.

At the annual meeting of the Staindrop Farmers' Club, the above was the subject for discussion. It was introduced by Mr. W. T. SCARTH. Mr. S. said:—

Owing to Mr. Sedgwick's absence from home, I have been asked to continue the subject brought before you, by Mr. Nelson, at the last meeting—"The best and most suitable education to qualify a man as a farmer." I feel some difficulty in entering upon a subject that implies so much: there are so many different classes of farmers—as much so as in any other branch of trade. I will, however, confine my remarks to the locality in which we reside. There was a discussion carried forward after the reading of Mr. Nelson's paper, which ended in one general conclusion—that a farmer could not be too well educated, or know too much of the business in which he was going to embark—that of making the most of the land he occupies; by which, gentlemen, I wish you to understand me to mean, turning his produce to the greatest advantage, and having his farm in a creditable state of management. In this locality the farms extend from 150 to 400 acres, where we may suppose the capital employed in each farm to be from £1000 to £4,000, though, I dare say, frequently less. By alluding to this, I want to show how impossible it is for farmers, from the return from the capital embarked, to afford any great expense in the education of their families; and I wish to bring before you, for discussion, the best education to be arrived at under these circumstances. I don't think a farmer, living from the produce of his farm, and with even a small family, which about here is not often the case, could send his sons from home when at an age to commence their education. He must

make the best out of that which is within his reach; which in this locality, I am told, is quite sufficient to give a youth a thorough good knowledge of arithmetic, reading, writing, and a little Latin as well, and at a very reasonable charge. Then we will believe, that at such a school as now exists in Staindrop, a boy from the age of nine to fourteen may acquire a thorough good knowledge of what I have mentioned, living with his friends, which I think is to his advantage at so early an age. The cost already incurred is small, and gives the parent an opportunity of expending the money he has to embark in completing the education of his son more profitably to the youth, who you may suppose, at the age of fourteen or fifteen, should begin to think a little for himself. I would then top him off at a good commercial school for a year or two: that brings him to sixteen, by which time he should be a thorough accountant, write a good hand, spell well, and know, as a matter of course, the history of his own country, and other branches of education. I should then wish to see him at home for a little, attending to what was doing on his father's farm, and not forgetting what Mr. Bell alluded to on a former occasion, acquiring a knowledge of the butcher's trade, which must be useful, and, as I think, absolutely necessary. A young man ought by this time to have read those preparatory works which point out to him the advantages derived from chemistry, geology, and the like, and I should expect that during the last two years of his schooling those sciences had not been neglected, but made an important feature in his studies. If a young man is anxious to become acquainted with those branches of science, he may acquire a good knowledge from the works within his reach; and, in this neighbourhood, where there is an

Agricultural Library, he has a double advantage. There is no doubt but that a young man who has become a decent scholar and acquired some little scientific knowledge, would be anxious to see other districts; this he may do if he chooses, at very little expense, but it would be absurd to think a farmer could, after giving his son a good common education, frank him about the country to see all the different modes of farming. Nor do I believe his even going to stay with another farmer, as an agricultural pupil, would be to him of such great advantage. If a young man could engage himself as an assistant in keeping the accounts on a large farm, I think that would be of great use; for I consider, generally speaking, that accounts kept on farms are anything but satisfactory. Now, I believe this a most important part of the young farmer's education; to be a good practical accountant, as well as a practical farmer. Gentlemen, if we have not a sufficiently good school for these purposes in Staindrop, we most assuredly should; but I have every reason to believe there is such a school in Staindrop, as well as others in the neighbourhood. We have unquestionably schools not far off as finishing schools. I will name one, as I think it is in the best locality; that is, Mr. Bruce's, of Newcastle, of which Mr. Bell, I have no doubt, could say more than I can, having a son there. I believe in this district, where we have some most excellent farmers, not one of them would object to a young agriculturist seeing what

is going forward on his farm, or answering or explaining anything that might be asked him, and taking a pleasure in so doing. We have one, I believe one of the largest and best markets in the north, at Darlington; and, in my opinion, there is every opportunity in this locality, for an intelligent youth acquiring that knowledge which should make him a good farmer, at a very reasonable rate. In continuing this discussion, I am anxious to learn the opinion of those who can speak from experience as to the incapacities that surround the farmer as to the education of his family in this district.

At the conclusion of Mr. W. Scarth's paper, a discussion took place as to the sufficiency of the means for education in this district, in which Mr. Hawdon, Mr. Graham, and others took part. Mr. NELSON also rose and said that he would join cordially in the cry of a high authority—"Educate—educate—educate"—for without education there was no getting forward in these times, and it was as beneficial to the landlord as to the tenant. He objected to schools which were restricted by religious opinion—he would have the pupils read the scriptures, which were the word of truth, and from which they could learn nothing but truth. So anxious were some individuals, without education themselves, for the education of their children, that he had known them make great sacrifices to obtain it. With present prospects, he would recommend farmers to give their children the best education in their power.

## CROYDON FARMERS' CLUB.

### THE MALT TAX—UNITY OF ACTION.

The monthly meeting of the club was held on Saturday, Jan. 29, at the King's Arms, Croydon, Mr. PAGE, Merton, in the chair.

A communication was read from the Arundel Farmers' Club, inviting the co-operation of this club in establishing a representative body in London, to consist of gentlemen elected by the members of the provincial clubs throughout the kingdom.

### THE CORN AVERAGES.

A letter was read from the Secretary of the meeting of farmers attending Brighton market, held last November, calling for co-operation in obtaining a revision of the present mode of taking the corn averages.

Mr. RAINCOCK (Woodcote) rose to bring the subject before the club. When they considered that a rental of some millions depended on the mode of taking the corn averages, and they were fully aware those averages were taken imperfectly, it was clear some means of rectifying this should be devised. Gentlemen attending markets must be aware that the returns were continually very imperfectly made. Those who attended Croydon market saw that there was literally no corn returned. In the last three or four months there was very little more than 100 qrs. of wheat, and no barley or oats. They all knew this, and he need say very little about it; but if they would only look to what their tithe had been reduced, they would find, since the passing of the Tithe Commutation Act, being a period of seventeen years, that the reduction had been only 2s. 6d. per cent., and he would ask those who had been farming so long whether they had not received during those seventeen years more than 2s. 6d. less on their produce? Since he had been farming he had seen a depression of 30 to 33 per cent.

and he naturally expected when his produce was reduced, his tithe would be reduced in a corresponding degree. He could see no hope whatever that under the present system they would ever obtain this. During the last seven years he had a paper showing that there had only been a reduction of 12 per cent. in the tithe. Now many of these had been very deplorable years, and, if they had only experienced a loss of £12 in every £100, they would find their pockets much better lined than they really were. Every one who had considered the subject—even the clergy themselves—was fully aware that the system did not work. They were all told now that they were about to lose the high year 1847, but under the present system there would always be some high year which would keep up the price of the tithe far beyond what it was intrinsically worth. Very possibly this year, after all their corn was sold, they might have high prices, and thus an average be made for 1853, much the same as that of 1847 had been for the last six years. A seven years' average would always work in a way diametrically opposed to the true interests of the grower of the corn. The first remedy he had to propose was, that no corn be returned more than once. Corn, if of good quality, now very frequently got returned three or four times over, whilst with inferior samples this could never happen. He would give them a case in point. Travelling lately in the north of England, he met some parties who told him of buying some barley at Stamford at 33s. per qr.; they next day they brought it to Cambridge, and it was sold at 35s.; and the following day it was taken to Stortford, and sold at 37s. Now, what he objected to was, that this sample was returned three times against the farmer. The man who bought it at Stamford knew its worth at Cambridge, while the seller at Stamford did not know its value. The result was that although the grower only got

33s. it was at last returned at 37s. The grower, then, only should be allowed to return it, for the last two returns, which were diametrically opposed to his interest, were an injustice, and it ought to be remedied. His next remedy was, that not only the buyer should make a return, but the grower, who was quite as much interested in the matter. One account would dovetail with the other, and they would thus get a more accurate return than at present. At the same time, the high and foolish penalty of £20 should be reduced to 20s., for at present no one dreamt of enforcing the penalty against a neighbour, however bad the system was; while if the fine were only 20s., to protect themselves, they would do it. His third proposition was that the average time of seven years be reduced to three. In many instances a man might not contemplate farming so long as seven years. His next point was, that a return should be made of all the corn grown, for, at present, a very large proportion of it was never returned at all. Had they not in their own case felt it continually, and, under free trade, they would feel it more and more every year, inasmuch as there would be more difficulty in selling an inferior sample? This year there was not so much difficulty because they did not send in so much from abroad; but if they had had a very abundant crop of excellent corn, they would have sent them in such a quantity that he would have defied them to get inferior corn returned at all. If they had a large quantity of peas and beans, their inferior wheats would hardly have been saleable. If they had low prices now, what would it have been then? and if, instead of selling, they chose to use them on their farm for feed, he saw no reason why they should not form a portion of that corn which formed the general average of the country. Many would say, how could they make a return of what was not sold? In all cases there was a corn inspector, and if a grower chose to keep 100 qrs. of barley, he did not see why he should not go to the inspector and say, "I have been bid 25s. for this, but I can make use of it at home, and I put it at 26s." Let the inspector have the option of taking the corn, if he pleased, at 5 per cent. above what the grower put it at, and they would always have a fair return. They would have the average price of the produce off a farm, whereas they had now just the *elite* of a man's corn off his best land, and the bulk of his produce did not find its way into the average. These were the difficulties under which they laboured. The present mode was not only imperfect, but it was unjust. They wanted a return of all they grew, not only of a few samples. Those who professed to be interested in the land told them if a thing was not worth selling they should put it back on the land. They did do so, but it formed no portion of the corn returned in the averages. He hoped club after club would show the injustice of it, and they had heard, whatever legislature they had—whether Whig, Tory, or Radical—if the farmers could only show any injustice pressing on them, it should be instantly redressed. It was possible that by their united and strenuous efforts this unjust mode of taking the averages might be remedied. Had it affected the manufacturing interest, it would never have been suffered to exist so long; but, like many other things, what was everybody's business was nobody's business, and so it was continued (loud applause).

Mr. STENNING, Godstone, was sure they must feel much indebted to Mr. Raincock for the very able manner in which he had brought the subject before the meeting (applause). With his first and second proposals he fully agreed. Mr. Raincock paid largely to the tithes, but the question was, in what way

could a more correct return be made, and the only way was, as suggested by Mr. Raincock, that the return should be made by both the buyer and the grower. A correct return would be a great advantage, for it would give them something like an idea of what was grown in the country. Some might say that ought not to be known, because their landlords might then, in some way or other, know what quantity of corn they grew; but the fact was, the more their landlords knew as practical men, the better it would be to do business with them. Matters had been so arranged that their profits were not going to be so great that they need be ashamed or keep back anything from their landlords. He would willingly let them know his produce. There would be this further advantage—the country, knowing the quantity of corn produced and the population, would know what further supplies were wanted, and thus extreme speculations might be prevented. The present return was most imperfect. The averages for the three years ending 1846 showed sales of 6,000,000 qrs., whilst for the three years ending 1851 they gave only 4,500,000 qrs. If they had had a correct return, that might have been some ground to go upon in the great free trade battle, but we felt that the account was so imperfect it could not be depended upon. They should either petition Parliament, or memorialize the Board of Trade on this subject, or it was of no use their meeting there. He had been very glad to hear the remarks in the circular emanating from the Arundel Farmers' Club, because he thought it important that there should be an origin of any subject to be discussed in the farmers' clubs. He thought there should be deputations from the clubs to a central farmers' club to be established in London, so that all might discuss the same subjects at the same time, and then they would derive some benefit; for they were an isolated party, and that was the reason they were placed in their present position, or they would have had redress long ago, and it was only by combining together they should get that justice done them to which they had been so long entitled. Nothing but justice did they ask for. They were willing to accept the principle of free trade, but let us have it in full perfection (loud applause).

Mr. RAINCOCK.—To get the growth of the country they must extend the 290 towns. The only question was, would government furnish the inspectors? They could not get it either, unless they inflicted a similar penalty on those who sold corn at home.

Mr. STENNING.—That was one of the subjects he meant to notice. That might be easily remedied, because all buyers attended some market, and it would be very easy for him or a neighbour to deposit his return in the market where the buyer agreed to go to. At Croydon, on the 1st January, there were only 135 qrs. returned.

Mr. CHASEMORE quite agreed with Mr. Raincock in every observation he had made. A buyer, however, was bound to make a return of all he bought, whether in the market or anywhere else.

Mr. RAINCOCK.—That only makes our case the stronger. We thought the return was only for that day, but it seems it is for the whole of the week. Mr. Chasemore must know there was nothing like the quantity sold returned.

Mr. CHASEMORE.—Yes, exactly.

Mr. RAINCOCK thought it important too the return should be from growers only, and not as at present from sellers.

The CHAIRMAN said, the first question was, whether the grower should be bound to make a return under similar penalty inflicted on the buyer. He thought that would be the first step to correct this evil. He should also suggest that the transaction should not be recognised unless by law, a proper

return was made by the grower. That would be a sort of penalty in itself, for to a dishonest person there would then be an opportunity of getting from a bargain if it turned out unfavourable for him. As to the number of towns in which the averages were taken, he certainly did think it was very limited. But he did not think it was expedient to reduce the term of taking the averages to three years. They had had a long period of high averages, and he thought the coming year was more likely to reduce than enhance them.

Mr. STENNING—1847 will soon go from us.

The CHAIRMAN—Yes, they were just emerging from a long period of high averages, and in a year or two they would have a low return instead of those unnaturally high rates. It seemed to him, an act of very great injustice was often done to what he called the non-capitalist farmer, that was to the man who was forced to sell his corn at a low price in the winter, whilst he paid the tithe average on the high rates of the following summer. He did not see any advantage the buyer had in swelling the averages; at least, all that it did for him was, to give him rather the advantage in the argument as to price between him and the dealer in the manufactured article. A high average might be used as a reason for keeping up prices. It appeared from the form of the buyer's return, that he was bound to give in all the corn he bought during the week, but that if he lived beyond the limits of the town it was quite optional; so that if Mr. Bates or Mr. Charrington did not think fit to do so, they were exempt from any penalty. He quite agreed that if they had a grower's return, it would be very useful to government in statistical enquiries. In Ireland the number of acres, and the crops, were taken by the police throughout the country, and they found it very easy to get their information. There could be no hardship nor any evil result to the grower in requiring him to make a similar return to that furnished by the buyer. The question was, should they adopt a duplicate copy of the Arundel petition?

Mr. BATES.—What does it say of inferior corn that never comes to market?

CHAIRMAN—If its being used at home was an evil to the grower, he must try and remedy it. Nobody helped you unless you helped yourself.

Mr. STENNING—I beg to propose that the Hon. Secretary get a copy of the petition drawn up, and that it lie in the market every Saturday until our next meeting for signature.

Mr. CASTLEDINE—I second it.

At the request of Mr. RAINCOCK, the CHAIRMAN read the Arundel petition, which suggests that the grower as well as the buyer should make a return.

Mr. RAINCOCK thought that if an alteration were made, it should be as complete as possible, and, if they strictly adopted that form of petition, they should not get that alteration. Now, as to a seven years' average, it was true after this year they would cease to pay on 1847. They would then stand precisely as before, and what benefit would the farmers derive from making it seven instead of three? If they happened to have a high year, it perpetuated its average for seven years.

Mr. STENNING—But that high average would come to a larger amount for three years. You never escape a high average; you must pay it.

Mr. BATES—You only escape the sudden transition.

Mr. PAGE—The legislature would act in this matter with reference not to the tenant-farmer only, but also to the clergyman. They want to avoid sudden changes in the amount. At the same time, after the late free-trade changes, it was most dishonest to continue to charge them on a seven years' average.

Some conversation followed between Mr. Raincock, Mr. Stenning, and the Chairman, the former showing the fairness of including bad corn used at home in the averages; and the latter demonstrating the impracticability of securing an adequate check on the grower's return, and stating that it was hopeless without such a check to ask the government to accede to Mr. Raincock's proposition. Even if it were granted, then they would always be suspected of tampering with the averages.

The adoption of the Arundel petition was put and carried.

## ON THE PREVALENCE OF DISEASE IN FARM STOCK.

Some time ago we called the attention of our readers to the almost certain results of the heavy and long-continued falls of rain which have been experienced. Every one acquainted with the influence which dampness exercises on the animal health, must have anticipated the accounts which are now becoming more general, of the unusual prevalence of influenza in horses, pleuro-pneumonia in cattle, and rot in sheep. The influence which continued falls of rain have on the health of a district can be best considered, by reflecting that all the rain which falls must either be carried off by natural or artificial drainage, or carried off by evaporation. When the two former are defective, the soil becomes so thoroughly saturated that the surrounding atmosphere becomes unduly loaded with moisture. Even with the most perfect drainage, a considerable portion of the rain which falls is raised in a state of vapour. To effect this, as much heat is required to raise a gallon of water as to raise  $5\frac{1}{2}$  gallons from the freezing to the boiling point. The abstraction, therefore, of caloric from the soil and from vegetable and animal life, especially from the latter, is very great, and the animal system can-

not part with such an amount of heat without the health being disturbed. The constitution becomes debilitated, and disease is superinduced, usually accompanied with a typhoid fever. Fevers are, however, more generally traceable to the miasma which is produced from vegetable and animal decay. Of course, the heavy rains accelerate this decomposition. This accompaniment of fever is one of the marked characteristics of influenza in horses, and to treat this disease successfully, this feature of it must be carefully studied. The treatment consequently requires to be more of a tonic than depleting nature; and bleeding to excess—if bleeding at all—should in no case be attempted without the aid of the best veterinary advice. But as this subject will be brought under our readers' notice in a few days by the discussion at the Highland Society, we do not enter upon it. To prevent, as far as possible, the disease, every means should be employed to guard the animals against dampness. In the season 1830-31, similar in character to this as regards heavy falls of rain, few farmers on the eastern coast escaped the visitation; and in East Lothian, to which our attention was more par-



ticularly directed, upon one farm 10 out of 13 horses died, in another 9 out of 18, and there were few farmers indeed who did not suffer more or less. Unfortunately the disease was generally treated by the veterinary surgeons and blacksmiths of the district as acute inflammation of the lungs; hence, bleeding and purgatives were the common treatment, and with the result which better knowledge would have enabled them to have anticipated.

Pleuro-pneumonia has been so often discussed in our columns that we pass on to the rot in sheep.

The accounts which we received from England vary considerably; in some districts, however, rot has decidedly manifested itself in a way which is alarming to the holders of sheep stock as to the ultimate results. Scotland having comparatively escaped the inundations which have extended over most of England, Ireland, and several parts of the continent, sheep stock is with us comparatively healthy, although we have heard of several instances where somewhat suspicious symptoms have made their appearance. But as the rearing of sheep in Scotland is confined principally to those districts the geological formation of which gives a soil and rock which readily part with the moisture, the effects of long-continued wet weather are less disastrous. In Ireland, however, owing to the substitution of sheep for the cottage holdings, great breadths in that country have been stocked with sheep. This has been usually done without any preparation being made as to surface draining or otherwise, and as a necessary result rot has appeared.

We quote from the *Roscommon Journal* :—

“The farmers are still suffering severely from the wet weather. The ‘rot’ in their sheep is increasing to an alarming extent. No disease with which cattle has hitherto been visited brought so much destruction to the farmer’s doors as that now prevalent amongst sheep. Sheep that cost £2 10s. a piece are now sold for the price of the wool on their backs.”

We have seen previous notices, and we have had private information, that in the western part of Ireland pleuro-pneumonia among cattle, and the rot in sheep, have been very prevalent—the former very fatal. Even should the weather now become settled, and followed by a dry spring, considerable loss will be experienced, while should the weather prove adverse the loss must necessarily be very serious. We believe we are right in stating that the mania which has existed in Ireland of late years to stock with sheep will now receive a check. The seasons for the last year or two have been particularly favourable for sheep stock, and it is only in such seasons as the present that its profitableness or non-profitableness, as a sheep-breeding district, comes to be ascertained. The sheep we have frequently stated is at home in a dry sunny climate with dewy pastures, and the great central plateaus of Asia have, from the very earliest dates both of profane and sacred history, been dotted with extensive flocks moved from place to place by their nomadic owners—“Sheep-pasturing Asia,” as Æschylus, one of the earliest Greek poets, describes it. Unfortunately, however, for sheep breeding in Ireland, the stock has been introduced into districts which are quite unsuited for the health of sheep; that these districts could possibly be made applicable for this pur-

pose is very probable; but drainage, and an equally necessary preparation—shelter for the more delicate breeds, must first be provided. We believe that by this time many Irish proprietors who have been over-estimating sheep as a source of wealth, are now beginning to see the visions dissolving into thin air. This is certainly much to be regretted, as there was something required to give a buoyancy of spirit, to lead to enterprise in that country. But nature’s laws must regulate all profitable agricultural enterprise; and if man intends to work antagonistic to them, he must make nature subservient to his purpose, by introducing other influences to overcome that antagonism. Shelter and artificial feeding are the most potent agents, for counteracting the natural disadvantages of that country, for sheep stock.

To attempt to cure rot may be regarded as hopeless, but stock can often be fattened although they are considerably affected. If suspicious are entertained of the herd, they should be forced forward with oats, beans, linseed-cake, cut hay; in short, anything they will eat, and as soon as they are at all in a condition for the butcher market, they should be disposed of. The removing to a dry upland pasture will also prove advantageous. Some have recommended salt, but there is difficulty in getting sheep to take to this. Altogether, rot may be regarded as one of the most serious diseases which affect sheep stock; and prevention, not cure, is what the stockmaster should aim at.—North British Agriculturist.

GERMAN WOOL REPORT.—BERLIN, Jan. 30, 1853.—The year 1853 is, undoubtedly, for our German wool trade, a year on which the great hopes of many for the improvement of prices of the raw material are attached. The regular good sales of wool, which have been effected since the clip up to the present time, not alone to our inland manufacturers and combers, but chiefly by the great and continued demand for England and France, have emptied our stocks to such an extent as was scarcely to be expected. The increased consumption, as well as the diminished quantity of coloured wools imported into the English market, and the deficiency in the shearing of last year in our country, account for this state of things; and it was natural that the prices of all descriptions of wool should creep up, and induce the contractors to pay higher prices for the coming clip. Great expectation of the result of the coming wool fairs prevail throughout the whole country, and the demands of the farmers are at present so extravagant that no reasonable business is, just now, to be done; but by far the greater quantity of the wool is already secured by the contractors. More has been contracted for than in former years, and it is not unlikely that the quantity of wool in first hands brought into the fairs will be comparatively small. The month of January has been very favourable for the wool trade; a great deal of business has been done lately. The remaining stock of good Markish and Pomeranian wools has been taken out of our market for the English trade, and higher prices have been paid for it than hitherto. In low fleeces there has been a large business done for England, which has created rather a sensation. The prices of this article, which was neglected, went up a few dollars per cwt. Prices paid for these low fleece wools (which contain locks, &c.), ruled from 35 to 50 r. d. per cwt. The same lively demand has existed for low coarse skin wools, of which large quantities have made their way to England and Scotland. Fine slipped wools were sold at 54 to 62 r. d. per cwt. The weather being very unfavourable for drying this description of wool, causes it to be rather scarce. In lambs’ wool no business could be done, though it has been much wanted, as there is no stock what-

## REVIEW OF THE CORN TRADE, 1852.

BY J. AND C. STURGEON.

In taking a brief review of the corn trade for 1852, we as usual annex some statistical tables. The year opened with an advance of from 5s. to 9s. per qr. upon Wheat from the lowest point of 1851; but a favourable seed time, and the promising appearance of the Wheat on the ground, together with a larger yield per acre of the previous crop than was expected, had a depressing effect on the trade, and prices rather gave way during the first seven months of the year. Although the arrivals of Foreign were comparatively light during this period, they were mostly sold at a loss to the importer. The cold dry spring and early part of summer was followed by a very warm July, which brought the grain rapidly to maturity, and caused a reduction in prices of 4s. per qr. In August a great deal of rain fell in the midland and southern parts of the kingdom, in consequence of which, and the fact that the early crops were in many cases seriously affected by mildew, a sudden advance occurred on Wheat of 4s. to 6s. per qr. In September the weather improved, but it was found, south of the Humber, that all except the late Wheats were generally much injured in quality, though the quantity was nearly an average. In the north of England and Scotland the crop proved abundant and of fine quality. A reaction in old Wheat of 2s. to 3s. per qr. took place when the harvest was generally secured, and the price of inferior new opened very low, say from 28s. per qr. and upwards; confidence was, however, soon felt that from having a more deficient potato crop than any since 1847, and the high relative prices abroad, an advance must soon take place. The unprecedented fall of rain from October to the present time has much strengthened this feeling, and English and Foreign Wheats have risen from the lowest point in 1852 about 10s. per qr., but the supply up to the present time both of old and new continues liberal, so much so of the former that we think at harvest the growers in this part of the country must have held not less than six months' consumption. Our imports of Wheat into Gloucester last year were 144,560 qrs., being 98,495 qrs. less than in 1851, while our stocks were 17,500 qrs. more at the end of 1852 than the same time in 1851. The greater part of the Wheat is yet unown, which is much against the yield of the next crop, which gives great confidence to holders; still we are in this respect in a better position now than in 1827, which provided a productive season of all kinds of corn. Notwithstanding an advance of 30 to 50 per cent. in freights, large purchases have been made abroad for the English markets, but we do not know a place from whence Wheat can be imported at a profit on our present quotations. Should there be however a demand for France, or the prospect of the next harvest become unfavourable, we look forward to considerably higher prices. The total quantity of Foreign Wheat and Flour imported in 1851 was 5,619,662 qrs., whilst in 1852 it amounted to only 4,376,103, shewing a falling off of 1,243,559 qrs.

The yield of Barley appears to have proved fully an average, but we think the number of acres under this grain were less than former years, and the supplies of all kinds have not equalled the demand; but large arrivals are expected in the spring.

Oats during the autumn were relatively cheaper than most kinds of corn, and having less from the farmers at market than usual our stocks were completely exhausted; and last month an advance of 2s. per qr. took place, chiefly in consequence of the speculation in Oatmeal.

The Foreign Beans at Gloucester were early cleared off, and

for some months our consumption has been mostly on English, the supplies of which (both old and new) have been large; and the same remark applies to new Peas.

We have had no Indian Corn, Dari, or Millet, at Gloucester, for some time.

## ESTIMATED STOCK AT GLOUCESTER.

1850, 1st Month, 1st.—Wheat, 23,500; Barley, 10,000; Oats, 12,000; Beans, 7,500.
1851, 1st Month, 1st.—Wheat, 50,200; Barley, 7,800; Oats, 5,900; Beans, 18,200.
1852, 1st Month, 1st.—Wheat, 55,901; Barley, 3,250; Oats, 5,366; Beans, 2,470.
1853, 1st Month, 1st.—Wheat, 75,425; Barley, 8,184; Oats, 5,088; Beans, 787.

*Birmingham, 1st Month, 26th, 1853.*

## AN ACCOUNT OF THE TOTAL QUANTITY OF WHEAT AND WHEAT FLOUR IMPORTED INTO GREAT BRITAIN FROM IRELAND FROM 1801 TO 1825.

Year.	Qrs.	Year.	Qrs.
1801.....	150	1814.....	225,478
1802.....	108,751	1815.....	189,544
1803.....	61,267	1816.....	121,631
1804.....	70,071	1817.....	55,481
1805.....	84,087	1818.....	105,179
1806.....	102,276	1819.....	153,850
1807.....	44,900	1820.....	403,407
1808.....	43,497	1821.....	569,700
1809.....	66,944	1822.....	463,004
1810.....	126,388	1823.....	400,068
1811.....	147,245	1824.....	356,384
1812.....	158,352	1825.....	396,018
1813.....	217,154		

## THE QUANTITY OF CORN, MEAL, AND FLOUR, IMPORTED INTO GREAT BRITAIN FROM IRELAND, IN THE YEARS 1828 TO 1852.

Year	Beans and Peas.						Wheat Flour.
	Wheat.	Oats.	Barley.	Qrs.	Malt.	Oatmeal.	
	Qrs.	Qrs.	Qrs.	Qrs.	Cwt.	Cwt.	
1828	474994	1805336	842041	11894	853	424749	621569
1829	340084	1417729	97140	14579	2011	402127	626268
1830	337641	1226486	189745	21573	2820		672265
1831	407714	1286254	185409	19171	10888	581371	524318
1832	552740	1662786	123639	16445	8220	611412	831434
1833	541475	1353533	101767	21760	7017	642692	1059587
1834	462229	1277598	217855	20947	3865	772994	1110463
1835	340535	1462581	156242	27682	10357	566006	1124343
1836	249360	1627324	184156	20524	22214	675470	1169200
1837	252720	1634720	187473	25690	4174	1004370	982290
1838	209600	1946050	156467	26816	5001	1252741	1168195
1839	90600	1290000	61676	13019	2861	877000	519000
1840	92980	1397500	95954	15976	3456	989500	280700
1841	113225	1667542	75568	16762	4935	1357321	331183
1842	112400	1275200	50200	21450	3050	1549500	313500
1843	191700	1559500	109650	25500	8600	1705300	773100
1844	200200	1509000	90700	19600	8000	1150000	839000
1845	371000	1678000	92000	14500	11000	1055000	1421000
1846	187300	956000	93000	17000	11000	554000	725000
1847	125700	493000	47500	27000	6500	330500	211000
1848	146000	1081000	79700	14700	6300	936000	561000
1849	94500	652000	43500	24600	5000	672000	393500
1850	76000	642400	51000	20400	19500	786000	397300
1851	45867	728566	44085	28774	6431	649502	172372
1852	20700	1047800	108900	30100	8700	971000	118900

AN ACCOUNT, IN QUARTERS, OF THE CORN, MEAL, AND FLOUR, IMPORTED INTO GREAT BRITAIN IN EACH YEAR, FROM 1ST JANUARY, 1816 TO 1852.

AVERAGE PRICE OF GRAIN PER QUARTER IN ENGLAND AND WALES, FOR TWENTY-FIVE YEARS ENDING 1852, AND WHEAT SINCE 1801.

Year.	Imported from Ireland.	Imported from the British Colonies.	Imported from all other parts.	Total imported.
	Qrs.	Qrs.	Qrs.	Qrs.
1816.....	373865	3	319203	1193071
1817.....	695651	25877	1775353	2466881
1818.....	1204733	56618	3474051	4754502
1819.....	967680	14257	1693255	2675192
1820.....	1415722	40897	1300953	2757572
1821.....	1822816	40916	2167738	2080470
1822.....	1063089	23439	102365	1188893
1823.....	1528153	209	53432	1581794
1824.....	1634000	891	609147	2244038
1825.....	2203962	95059	962718	3261739
1826.....	1693392	30500	2218830	3942722
1827.....	2828460	61035	2550310	5439055
1828.....	2826590	21600	1272396	4102586
1829.....	2307244	7335	2680411	4994993
1830.....	2215521	79634	2355412	4650567
1831.....	2429182	225240	3316760	5971182
1832.....	2990767	129476	668422	3788665
1833.....	2737441	117445	336524	3191710
1834.....	2792658	66829	492071	3351558
1835.....	2679438	25016	296189	3000643
1836.....	2958272	18561	625032	3601865
1837.....	3030293	19060	1306870	4356223
1838.....	3474302	19479	1512520	5009031
1839.....	2243151	17438	4573660	6834249
1840.....	2327782	178828	3811694	6318304
1841.....	2855525	308382	3378599	6542506
1842.....	2083600	247127	3475970	5806697
1843.....	2721400	146647	1299776	4167823
1844.....	2460800	297926	2794357	5583083
1845.....	2992800	312438	2118707	5423945
1846.....	1625000	431075	4480302	6536777
1847.....	879900	546431	11769728	13196059
1848.....	1827000	229313	7125688	9182338
1849.....	1175000	210510	10616388	12001848
1850.....	1212500	126532	9618420	10743253
1851.....	1136160	163278	9773733	11073171
1852.....	1580600	130766	7835786	9556200

PRICES OF GRAIN IN FOREIGN PARTS, PER QUARTER, IN 1851 AND 1852, MOSTLY TAKEN IN DECEMBER.

	WHEAT—1851.			WHEAT—1852.				
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.		
Dantzic.....	36	0	to 41	0	49	0	to 51	6
Do, high-mixed.....	41	0	.. 43	0	52	0	.. 54	6
Leghorn.....	31	0	.. 49	0	35	0	.. 48	0
Rostock.....	40	0	.. 43	0	46	0	.. 48	0
Trieste.....	27	0	.. 35	0	34	0	.. 43	0
Hanburg.....	40	0	.. 44	0	41	0	.. 46	0
Petersburg.....	34	0	.. 36	0	36	0	.. 39	0
Genoa.....	32	0	.. 38	0	36	0	.. 42	0
Naples.....	32	0	.. 38	0	39	0	.. 43	0
Konigsberg.....	43	0	.. 46	0	42	6	.. 51	0
Bordeaux.....	37	0	.. 41	0	43	0	.. 46	0
Marseilles.....	36	0	.. 44	0	36	0	.. 46	0
Nantes.....	38	0	.. 40	0	40	0	.. 45	0
Odessa.....	25	3	.. 30	10	23	4	.. 32	10
Ancona.....	32	0	.. 34	6	36	0	.. 40	0
Stettin.....	41	0	.. 42	0	45	0	.. 49	0
Bilbao.....	38	0	.. 41	0	41	0	.. 46	6
Gatzl.....	18	0	.. 24	0	24	0	.. 27	0
New York.....	36	0	.. 41	0	43	0	.. 47	4
Philadelphia.....	37	0	.. 40	0	42	0	.. 44	8
Montreal.....	27	0	.. 31	0	36	0	.. 40	0
Taganrog.....	26	0	.. 28	6	28	0	.. 34	6
Alexandria.....	26	9	.. 27	0	31	0	.. 35	9
Constantinople.....	21	0	.. 29	0	27	6	.. 34	6
Archangel.....	25	6	.. 26	0	29	0	.. 34	0

Year.	Wheat.		Wheat.		Barley.		Oats.		Beans.		Peas.		
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	
1801..	115	11	1827..	56	9								
1802..	67	9	1828..	60	5	32	10	22	6	38	4	40	6
1803..	57	1	1829..	66	3	32	6	22	9	36	8	36	8
1804..	60	5	1830..	64	3	32	6	24	5	36	1	39	2
1805..	87	1	1831..	66	4	38	0	25	4	39	10	41	11
1806..	76	9	1832..	58	8	33	1	20	5	36	5	37	0
1807..	73	1	1833..	52	11	27	6	18	5	35	1	37	0
1808..	78	11	1834..	46	2	29	0	20	11	36	7	35	0
1809..	94	5	1835..	39	4	29	11	22	0	30	0	30	3
1810..	103	3	1836..	48	9	33	2	23	1	38	4	37	3
1811..	92	5	1837..	55	10	30	4	23	1	38	7	37	9
1812..	122	8	1838..	64	4	31	5	22	5	37	4	36	8
1813..	106	6	1839..	70	6	39	1	26	6	41	3	41	1
1814..	72	1	1840..	66	4	36	3	25	9	43	6	42	5
1815..	63	8	1841..	64	5	37	0	22	5	39	1	40	5
1816..	76	2	1842..	57	5	23	6	19	3	32	2	31	1
1817..	94	0	1843..	50	2	33	5	18	3	29	1	31	1
1818..	83	8	1844..	51	3	29	7	20	7	34	6	33	5
1819..	72	3	1845..	50	9	31	8	22	6	39	0	38	6
1820..	67	11	1846..	54	9	32	9	23	8	39	0	39	0
1821..	56	2	1847..	69	5	43	11	28	7	50	1	51	5
1822..	44	7	1848..	50	6	31	6	20	6	36	9	39	1
1823..	53	5	1849..	44	6	27	9	17	6	30	3	31	3
1824..	64	0	1850..	40	4	23	5	16	5	26	11	27	5
1825..	68	7	1851..	38	7	24	2	18	7	32	9	27	5
1826..	58	9	1852..	41	0	28	7	19	1	28	4	30	5

Year.	Wheat.		Barley.		Oats.		Beans.		Peas.		Buck.		Lin. Corn.		Flour and Meal.		
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	
1801..	115	11	1807..	103	3	1813..	103	3	1819..	103	3	1825..	103	3	1831..	103	3
1802..	67	9	1808..	94	5	1814..	103	3	1820..	92	5	1826..	103	3	1832..	103	3
1803..	57	1	1809..	78	11	1815..	103	3	1821..	56	2	1827..	103	3	1833..	103	3
1804..	60	5	1810..	103	3	1816..	103	3	1822..	44	7	1828..	103	3	1834..	103	3
1805..	87	1	1811..	92	5	1817..	103	3	1823..	53	5	1829..	103	3	1835..	103	3
1806..	76	9	1812..	122	8	1818..	103	3	1824..	64	0	1830..	103	3	1836..	103	3
1807..	73	1	1813..	106	6	1819..	103	3	1825..	68	7	1831..	103	3	1837..	103	3
1808..	78	11	1814..	72	1	1820..	103	3	1826..	58	9	1832..	103	3	1838..	103	3
1809..	94	5	1815..	63	8	1821..	103	3	1827..	53	5	1833..	103	3	1839..	103	3
1810..	103	3	1816..	76	2	1822..	103	3	1828..	64	0	1834..	103	3	1840..	103	3
1811..	92	5	1817..	94	0	1823..	103	3	1829..	64	0	1835..	103	3	1841..	103	3
1812..	122	8	1818..	83	8	1824..	103	3	1830..	64	0	1836..	103	3	1842..	103	3
1813..	106	6	1819..	72	3	1825..	103	3	1831..	64	0	1837..	103	3	1843..	103	3
1814..	72	1	1820..	67	11	1826..	103	3	1832..	64	0	1838..	103	3	1844..	103	3
1815..	63	8	1821..	56	2	1827..	103	3	1833..	64	0	1839..	103	3	1845..	103	3
1816..	76	2	1822..	44	7	1828..	103	3	1834..	64	0	1840..	103	3	1846..	103	3
1817..	94	0	1823..	53	5	1829..	103	3	1835..	64	0	1841..	103	3	1847..	103	3
1818..	83	8	1824..	64	0	1830..	103	3	1836..	64	0	1842..	103	3	1848..	103	3
1819..	72	3	1825..	68	7	1831..	103	3	1837..	64	0	1843..	103	3	1849..	103	3
1820..	67	11	1826..	58	9	1832..	103	3	1838..	64	0	1844..	103	3	1850..	103	3
1821..	56	2	1827..	53	5	1833..	103	3	1839..	64	0	1845..	103	3	1851..	103	3
1822..	44	7	1828..	64	0	1834..	103	3	1840..	64	0	1846..	103	3	1852..	103	3
1823..	53	5	1829..	64	0	1835..	103	3	1841..	64	0	1847..	103	3			
1824..	64	0	1830..	64	0	1836..	103	3	1842..	64	0	1848..	103	3			
1825..	68	7	1831..	64	0	1837..	103	3	1843..	64	0	1849..	103	3			
1826..	58	9	1832..	64	0	1838..	103	3	1844..	64	0	1850..	103	3			
			1833..	64	0	1839..	103	3	1845..	64	0	1851..	103	3			
			1834..	64	0	1840..	103	3	1846..	64	0	1852..	103	3			
			1835..	64	0	1841..	103	3	1847..	64	0						
			1836..	64	0	1842..	103	3	1848..	64	0						
			1837..	64	0	1843..	103	3	1849..	64	0						
			1838..	64	0	1844..	103	3	1850..	64	0						
			1839..	64	0	1845..	103	3	1851..	64	0						
			1840..	64	0	1846..	103	3</									

## THE TENANT-FARMER.

"Perhaps the greatest libel urged against the tenant-farmers of this country is their assumed disinclination to advance, or to make the most of those improvements offered to them." This sentence will be found in our leader of last week. It came naturally enough in the consideration of the subject we were then pursuing, and was certainly written without intended reference to any particular person or project. It may be necessary here to fully discuss the opinion we then gave; the more so, especially as our own conclusions may, otherwise, be supposed to entirely agree with those advanced by some of our recent correspondents. The course, from the very first, adopted by this journal has been strictly that of *audi alteram partem*. The endeavour has been to keep thoroughly independent of all party as well as individual influence, and thus to ensure the case of either side being fairly stated. By such means alone can we hope to arrive at a safe and correct appreciation of the question debated. Acting on such a determination, it is scarcely necessary to add, that it would be simply unjust and absurd to identify the principles of a journal with those of any casual correspondent who might happen to address it.

With this, at times, perhaps, necessary caution, let us return to the point with which we commenced. For some years now, be it remembered, the English tenant-farmer has had to struggle against two of the greatest impediments to enterprise and exertion that human nature and man's industry have ever had to contend with. His has been a withering depression coupled with a feeling of uncertainty. It is only within this last week or so that he has really known on what terms he is to proceed for the future. He was taught to consider that, in the otherwise general benefit effected, he was the only sufferer; and, as is really the case, that he alone was denied the liberty and encouragement of a system, whose very title remains a mockery until more fully carried out. Some of his advisers, and these no doubt with the best intentions towards him, almost, if not directly counselled him not to persevere—not to do his best under such circumstances, but to await until more equal justice was awarded him.

So the English tenant farmer has *not* persevered—has *not* made the most of the scanty and comparatively unfair opportunity allowed him. He alone has *not* progressed. He has shown a want of spirit to meet the many difficulties that surrounded him, and a want of intelligence to

grapple with them. He it is that has been standing still, with ignorance and apathy as his dearest friends, and indolence and pauperism as his best of arguments. Is it so? Are we to take as home-truth what is thus so courteously offered to us? And will it really bear the touch of that plain, matter of fact personage called *Proof*? We are afraid not. We believe, indeed, on the other hand, that no class will be found to have advanced more certainly, or to have made greater strides in comparison with what they previously had done, than the tenant-farmers of this country, during the last few years. We don't say that they have run wild after every will-o'-the-wisp dancing before them. We don't say that they have religiously done all, or half, or a third, or a fourth, that the heaven-born oracles have assured them they ought to do. Mercy on them if they had! But we do mean to affirm that they have increased wonderfully in intelligence—that they have progressed as surely in the labour of their vocation—and that they have evinced judgment in testing, and spirit in applying the many recipes offered by science to their notice.

Have we any "proof" here either? Where shall we seek it?—In the usual gatherings of the class, in the published records of their proceedings, in the testimony of those trades associated with and mainly dependent upon them, or in the homesteads of England themselves? Let us visit their meetings first—those of the Royal Agricultural and many other societies—and let us see what a position the tenant-farmer holds here. Does he show any want of intelligence or spirit in competing with those who enter under so much greater advantages? Does he not fairly hold his own? and does not the prize-list show year after year how the ranks of these successful practical farmers are widening? Is there *no progress* here? Or, turn to the Journal of that society we have just named, and mark the communications from the practical farmers—the prize-essays, the clear reasoning, the sound deduction to be found in every number. Is there no intelligence, no knowledge, no education, *no progress* here? Or, go to their smaller meetings, yet more closely confined to the farmers themselves, and hear the ability and sound sense with which almost any question affecting their interest is discussed. Are there no signs of *progress* here either? Or, inspect the workshops of our implement-makers, and inquire if there be not a great and increasing demand amongst the farmers them-

selves for such of their inventions as are fully proved to be necessary and beneficial? And then—call on the man himself; converse with him as you go round, and mark what he is doing and what he would wish to do with only fair play. The result is but too evident. Despite his improved breeds of cattle, his improved system of farming, his general knowledge, and so forth, he is “an ignorant, apathetic, selfish dolt, without one redeeming quality but that hospitality he presses upon you, and which in him is far more likely to be the vice of a sot than the hearty feeling of a man.”

It may be asserted that we have coloured this picture of the tenant-farmer too favourably for common use. We think not. Consider how he has been tried, and what nevertheless he has accomplished. We believe that he has shown every inclination to move on, notwithstanding the upbraiding manner in which he has too often been told to do so. Fortunately, however, for himself, he advances with some caution; science with him must have the recommendation of practice, and his progress be regulated by something more substantial than the blind confidence of mere theorists.—Mark Lane Express.

## AGRICULTURAL STATISTICS.

Sir,—The Census Commissioners of Ireland have terminated their labours by the production of a volume fraught with important information bearing on the present position and future prospects of the sister island. It consists of part 2 of the census returns returned to both houses of parliament by command of her Majesty, and is entitled *Agricultural Returns, 1851*.

The information thus collected forms the *data* of thoughtful reflection, as it is not a little encouraging to perceive that, in the midst of agrarian agitation, and in spite of the depopulating tendency of the exodus, the thews and sinews of the Milesian population are still to be found willing to encounter all risks rather than abandon utterly the soil of their fathers. It is still more encouraging to perceive that, as regards Ireland at least, the effect of recent legislation has not been the withdrawal of all enterprise from the cultivation of the soil, nor the entire prostration of the energies of the agricultural body.

The commissioners have confined their labours to three divisions of inquiry—namely, holdings, crops, and stock; and they give a comparison of similar results for the periods from 1847 to 1851, excluding from their calculations, for obvious reasons, the ill-fated year of 1848. Of holdings, from under one acre to 500 and upwards, there are in the 163 unions which form the 32 counties of Ireland 608,066, being a decrease since 1841 of 20,156; yet it is not a little remarkable that within the same period the tillage returns show an increase in the total quantity of cultivated land, which in 1841 was 13,464,300 acres, and in 1851 14,802,581 acres, being an increase of 1,338,281 acres. This is certainly evidence of an improvement in the right direction; and it is borne out by the corresponding changes in the relative proportion of one class of crop to another, indicating an important alteration in the management of farms in Ireland, as taking the basis of the years 1847 and 1851, we find in 1847 the proportion of cereal to green crops was in acres 4 6-10ths to 1; while in 1851 the proportion was 2 3-10ths to 1; and in the cultivation of flax alone the increase in one year, 1850-51, has been 49,496 acres.

The commissioners give an interesting table, showing the proportion each description of crop, in 1851, bore to the 100 acres on each class of holding, the distinguishing features being the diminished portion which oats, barley, potatoes, and flax, as grown upon the larger farms, bear to the proportions of these crops on the smaller farms, the difference being made up by the increased quantities of turnips, “other green crops,”

and meadow. Wheat, it appears, was most extensively grown upon farms from 50 to 100 acres, but the largest proportion of cereal crops (57 2-10ths per cent.) is shown to belong to farmers holding from 5 to 15 acres. The greatest extent of flax is grown upon holdings from 5 to 30 acres. The largest proportion of meadow (45 6-10ths per cent.) belongs to the class above 500 acres; on this class is also cultivated the greatest proportion of turnips, “other green crops,” beans, and peas; but wheat and other hard grains, as also potatoes and flax, are cultivated to a comparatively limited extent.

The returns of “produce” are equally encouraging, and by reducing the quantities of produce grown to one common standard—say tons of 2,240lb. each—we are furnished with the following results, showing the number of tons of produce grown in each year:—

	1847.	1849.	1850.	1851.
Cereal crops .....	2,548,503..	2,182,514..	2,113,327..	2,165,851
Green do. { Potatoes .....	2,048,195..	4,014,122..	3,951,990..	4,441,022
{ Turnips .....	5,769,616..	5,805,848..	5,439,065..	6,081,326

The returns of “stock” are classed under the respective denominations of horses, mules, asses, horned cattle, sheep, goats, pigs, and poultry; and the following is the result of their classification:—

	1847.	1849.	1850.	1851.
Horses and mules ....	557,917..	548,288..	548,719..	543,312
Asses .....	126,355..	117,939..	123,412..	136,981
Cattle .....	2,591,412..	2,771,139..	2,917,949..	2,967,461
Sheep .....	2,186,177..	1,777,111..	1,876,936..	2,122,128
Pigs .....	622,459..	795,463..	927,592..	1,084,857
Goats .....	164,063..	182,988..	201,112..	236,313
Poultry .....	5,691,955..	6,328,001..	6,945,146..	7,479,694

Taking the assumed average value per head of each description of stock which the Census Commissioners of 1841 arrived at after due enquiry—namely, horses and mules, £8 each; asses, £1; horned cattle, £6 10s.; sheep, £1 5s.; and poultry, at 6d.—we find the total value of farm stock to be in 1847, £24,820,547; in 1849, £25,692,616; in 1850, £26,951,959; and in 1851, £27,737,393.

This is but a summary of the main facts which the commissioners give in great detail and in minute subdivisions as to locality; and, altogether, the work forms a complete compendium of the more valuable statistical information.

I trust the more elaborate labours of the commissioners to whom are intrusted the compilation of the census returns of Great Britain are not to terminate without the production of an equally valuable synopsis of agricultural statistics for Eng-

land and Scotland. It is surely not to be said that "They manage these things better in Ireland," and it is scarcely creditable if the only authentic reference we have on a subject of imperial importance is confined to a sectional part of the country, and that not the one most calculated to afford a just estimate of all we should desire to know of a subject on which we have hitherto been greatly in the dark.

You have recently indicated what you consider as the probable course to be adopted by government on the meeting of parliament in reference to questions of a purely popular nature, which a new government is ever more desirous of taking in hand, to the disadvantage of those minor reforms which, although of a less captivating nature, are oftentimes more permanent in their results; and you hazard the opinion that the administrative capacity of the most talented and practical ministry we have seen for years will not be unwisely directed to the promotion of those measures which affect the every-day concerns of life.

The question of the collection of agricultural statistics is one of those quiet measures which the circumstances of the times and the reiterated opinion of those most competent to judge on the subject strongly urge upon the attention of government. The time is most fitting for the collection and compilation of such matter. The lurking prejudices of the farmers have vanished with the last rays of protection, and all really practical agriculturists begin to see that their true in-

terests are centred, not in ephemeral schemes and delusive hopes, but in energy and enterprise, "a fair field and no favour." This is evidenced by the encouragement shown to the Highland and Agricultural Society of Scotland in their experimental efforts on this subject, as Sir John McNeill is reported to have stated at a recent meeting of the society "that, in reference to agricultural statistics, he was glad to say the society would soon be in a position to proceed with the proposed inquiry; and he was happy to add that they had already met with the sympathy and cordial co-operation of the tenant farmers." We have the example of the importance other governments attach to this matter—France has her Minister of Agriculture; and, according to the *Berlin Gazette*, Prussia is already acquainted with the results of the harvest of 1852, under the hands of "Von Beckedorfe, Minister of Agriculture for Prussia." Of the importance of the subject you have, upon more than one occasion, spoken with some degree of authority. The member for Wakefield, Mr. George Sandars, pressed the matter on the late ministry, and I firmly believe, if taken up by the present government, it will be regarded by the agriculturists themselves in a more favourable light than anything hitherto held out to them in the shape of alluring hopes by those who have been styled, *par excellence*, "the farmers' friends."

I am, Sir, your obedient servant,

London, Feb. 9.

D. T.

—The Times.

## CALENDAR OF HORTICULTURE.

The month of March is one of the most important during the whole year, and its influence extends almost to every crop that is sown. A peck of March dust being worth its weight in gold, is an adage coeval with the recorded practice of agriculture; and, like the anvil of truth, it withstands all the hammers of battery and assault. The sowing of winter crops, as common and spring wheats, is finished in March; oats and barley are mostly done during its currency, and also beans and peas. The beginning is made in preparing the fallow lands, and grass seed may be sown, and the lambing season is busy. All the animals of the farm require much attention, and must be amply provided.

In suitable weather, the sowing of grains is performed with quickness and energy in this month; oats, spring wheat, barley, peas, beans, vetches, all so fast as the means can be found to execute the purposes; flax-seed is sown, and lucerne on well-prepared grounds, at 12 to 20lbs. on an acre, and dressed with gypsum on the young herbage. Sow carrots and parsnips on well-prepared soils; drill at 18 inches distance, on the flat surface, with seeds steeped in urine, or in a solution of nitrate of potash, six to one, and encrusted with quick lime to dryness. Top-dress clovers and young wheats with applications of powdered rape-dust, malt combs, gypsum, and nitrate of soda; the latter in 1 to 2 cwt.

per acre. Sow cabbage seeds for summer plants. Put light stock on watered meadows. Set traps, and spread mole-hills; bush-harrow, roll, and finish the dunging of grass lands.

The planting and cutting of timbers of every kind must now be finished. Plant hops on dry land, trrenched and well prepared; make the hills distant in 6 feet each way, which best admits the scarifier; put four sets in each pit, one in each corner, and cover lightly with earth.

Begin to cross-plough the lands intended for green-crop fallows; remove all turnips from the fields, and carry out dung in weather unfavourable for sowing.

Send the strong lambs to the natural and artificial grasses, or to the watered meadows. The ewes will now drop lambs very fast, and will claim much attention. Feed amply with juicy food, as swedes, beetroot, and cabbages, which must be preserved in store for that most important purpose.

The feeding of hogs for bacon will cease this month, and the foremost fat bullocks may also be removed by sale. Remove all dung from the yards to the manure heaps, and keep all houses clean. Set poultry on eggs for hatching feed well; attend to cleanliness, and provide good accommodation for the young broods. It is both pleasant and profitable to have a numerous and healthy flock of poultry on any farm.

## GENERAL REMARKS.

A sudden but not unexpected change of weather has altered the appearance of things entirely; a fall of snow exceeding in quantity that of many years has overwhelmed all the outward works, and put a stop to many things which were in hand at its commencement; while the fact of its coming on without any previous frost, renders wheeling and carting equally impracticable as before the storm, except in those cases where the snow was removed from the road-ways, and other spaces operated upon the night before a severe frost, when it was rendered hard enough to bear wheel-carriages of all kinds. This duty we hear has been done in many cases, and though we have no hopes of it being of service to our readers after the time this reaches them, yet it may give them a hint that may be useful hereafter. A person with a broom will sweep a great length of wheel-barrow roadway in a few hours, and the unevenness being smoothed, at the same time a nice path is presented to work upon the next day.

## PLANT HOUSES.

*Conservatory.*—Attention to fires will be one of the principal duties here if the weather keeps severe, and be sure never to leave a fire for the night that is at all doubtful. Many hot-water works are heated by fires constructed more for novelty than use. An attempt made to economize the fuel employed has often led to preserve it altogether; for it not unfrequently happens that it will not burn at all, except with an amount of labour and attendance more than double the value of all the heating materials that ought to be wanted in a year. On this subject we shall have something to say hereafter; in the meantime, while severe weather lasts let nothing be omitted likely to endanger the proper heating of this and other houses and pits used for forcing or preserving exotic plants, as it sometimes happens the neglect of a few hours on a sharp night is attended with consequences to plants which years cannot restore. But while urging the requisite care, we do not by any means insist on the same heat being wanted as usual in milder weather; the thermometer may safely sink 5 degs. on a severe frosty night below the average heat of other nights without any harm being done—in fact it is better to do so than keep up that severe amount of fire-heat required to maintain so high a temperature. And while the frost lasts, let all inside work be proceeded with, and any of an extra kind that may be wanted should now be done.

## FORCING DEPARTMENT.

Ice and snow try very much the efficiency of the dung, or other fermenting materials that may be used here. Frequent linings will, in consequence, be necessary, and means taken to prevent frosty winds, &c, robbing them of their heat; thatched hurdles are very good things for that purpose, and being portable are easily moved from place to place. Uncover the glass every day, and be sure that it is clean, so as to admit the cheering influence of sunshine inside; a little air may also be often admitted by a very small

opening at top, which, if only for half an hour, effects a great exchange of air. Cover up early, and securely—of course, guarding against steam. An oil-cloth covering is undoubtedly the best; but its expense prevents its general adoption. Attend to the instruction given in former numbers as regards the culture, &c., of the various inmates here; and prepare dung and other things for future use.

*Vinery.*—While severe weather lasts do not urge on so much fire heat; rather let the house get warm by the little sunshine we often get in the day time, than be overheated at night by the dry harsh warmth which an overstrained fire is sure to present, while large supplies of moisture supplied to soften the heated air is likewise objectionable; nevertheless, a certain amount of the latter commodity must be there, otherwise the drain upon the tender foliage will be too great, for most plants while in a growing state delight in a moist atmosphere, which can be furnished by placing shallow vessels of water over the heating apparatus, which replenish as required. Those now coming into bloom had better be kept a little drier, while those which have not yet been tied-in must be done now as they want it, stopping at the same time all shoots not wanted for long canes; the old plan of nipping off all such shoots one eye before the bunch has never been superseded by any later suggestion, but the method of thinning the shoots so as to have as few superfluous ones as possible is one certainly worthy of attention, and one we heartily recommend, especially with vines that are not too strong, and probably heavily loaded with fruit; when the reverse is the case an opposite course must be adopted, for vigorous vines require a great extent of foliage to digest the food with which these stems are charged, and to place too narrow limits on this will be to cripple the energies of the plant, and the result will be a less robust growth than it ought to be.

*Peach-houses.*—Diminish the amount of fire heat while the frost lasts, and be careful about letting in any quantity of cold chilly air, except in such a way as to modify it of most of its pernicious qualities. If the internal atmosphere of the house becomes too warm in bright sunshine, a portion may be let out at the top ventilators, by opening them a little while, and placing muslin, or some other check, upon the direct influx and efflux of air: this will materially relieve the house of its undue heat, while the portion admitted will be also softened so as to become harmless. Water the borders and other places wanting it, and disbud and tie in all shoots requiring the one or the other. The fruit also may be thinned in the same gradual way that we advised the disbudding to be done; reserving a good portion of the fruit, however, until the "stoning" process be over, when the principal danger of their dropping will be past. Keep a sharp look-out for insects, which are quite as likely to be clinging to potted plants that may be allowed a lodging here, as the more legitimate crop of the house.

*Pineries.*—It is better in most cases to defer all im-

portant changes here until milder weather, as, however carefully the operations may be done, the going in and out necessary to bring in fresh tan or other substances lets in an amount of cold chilly air, from which it is difficult to save the plants if they be in the same house, which they not unfrequently are, piled away in the paths, shelves, &c. But while we advise this work to be deferred, all other connected with the interior arrangements of the house, in the shape of cleansing or dressing of plants that may be allowed a place here (apart from the proper occupants), may have every attention they require, and the same remedies applied in the way of modifying the heat of the structures by moisture may also be applied, while some little egress for vitiated air may be also tried similar to that recommended above for the peach-house, only it must be on a smaller scale; and, in cases where the pine structures are of a low kind, or easily accessible from without, covering up at nights with mats, oilcloth, or other covering, will save fire-heat to a great extent, and be better for the plants too.

**Cold Pits.**—In these structures we presume many of the intended ornaments of the flower-garden are now stored away; these, if at all touched with frost, must be very gradually inured to the light and air again, as much mischief results in their being too suddenly exposed to currents of mild air after their long confinement; it is needless to urge on their being well covered up, as after some 18 degs. or 20 degs. of frost, which has been felt in many places, the capability of their "dwelling" to resist cold will have been tested tolerably well; and if they have hitherto escaped unhurt, the same treatment will assuredly carry them through all the changes that are likely to happen after this.

#### KITCHEN AND FRUIT GARDEN.

The frost and snow have come in good stead to retard the blooming of such wall-trees as showed symptoms of it during the latter part of the mild weather, while but little harm is done so long as they are not expanded. Keep a sharp look-out to the Gooseberry and Currant trees, which are likely to suffer at this season by small birds (especially bullfinches), picking out the young buds. We have seen almost all the trees in a garden spoiled in a day, or at most two days, by these audacious depredators. In the kitchen garden take all advantage of the weather to dig and wheel where wanted: only do not dig in the snow, because, whatever benefit it may confer on the ground by lying there and melting, it certainly does harm by being dug in. Cover up and protect Peas and other tender crops that it may be prudent to save against the vicissitudes of the season, and examine carefully all stores that may be put away. This latter duty may be as well done on wet or stormy days.

#### FLOWER GARDEN.

The necessary stand-still observed here while the snow lies on the ground must be exchanged for one of great activity when it becomes fine and more settled weather, and all outstanding work must be finished forthwith; but while it remains severe, prosecute all inside work that has a bearing on this as well as other departments; for it certainly has a tendency to forward the whole when the most advantageous time is taken to prosecute the duties required by each; so that, although all departments will require increased attention hereafter, yet, if anything can be done now to relieve the pressure then, that operation ought at once to be done by the collective force, regardless of the duties which each holds as its peculiar "own." But we will return to this subject in another chapter, and leave this for the present, hoping (no doubt, like many of our readers) that the present show of winter

will continue with us until it finally takes its departure for the season, and not return after an absence of a week or two, when the advancing vegetation will render its visit unpopular.—J. R.

#### CHICKENS—GAPES—PIP.

Poultry is now an acknowledged item in the live stock of a farm, and, in the general race of improvement, is coming in for its legitimate share of consideration and progress. The young of poultry is not difficult of production, but their rearing presents difficulties of no ordinary character. The principal disease incident to the early stages of their growth is gapes or pip. It is known by their opening their mouths very widely, as if something were sticking in their throats and choking them. When hungry they take up a bit of food, but the soreness in the neck prevents their swallowing it; they therefore drop it out of their bills, and are consequently starved.

"M. A. T.," *Wm. Ester*, quoted by you, says the disease is generally very fatal: a neighbour of his lost 100 by it last summer. Medicine is, he says, useless; and his only cure is, to cram the chickens three or four times a day, which keeps up their strength, and enables them in a short time to overcome the disease.

Many years ago I saw a lot of chickens, some of which were very severely affected by this disorder; and on informing an old lady, the owner, she said she would go down and cure them. She accordingly took up a starved and convulsed one, and holding it in her left hand, its tail towards her little finger, its body in the middle of her hand, its head encircled between her fore-finger and thumb, she took from an attendant a middling blade of fresh grass, bent double so as to form a small angle, and holding it in her right hand, she put down carefully the angle of the blade of grass with her right hand into the middle of the throat of the chicken, and, when down towards the extremity of the neck, she gently pressing the angle (but not the side) of the blade against the neck of the chicken, drew up the blade of grass, gently pressing the angle against the chicken's neck, and brought up in the angle of the blade one or more worms, about two inches in length, which she thus extricated from the neck of the chicken. By repeating the operation she brought up some more, and thus instantly relieved and cured the chicken. From this operation the cause and cure of the disease are manifest, and by it I repeatedly cured diseased chickens, and under my directions many parties cured theirs, and on the appearance of gapes or pip, the operation has been uniformly successful in extracting worms, and curing the chickens.—*M.—Mountview, Rathgar, Jan. 27, 1853.—Irish Farmers' Gazette.*

**EXTRAORDINARY SALE OF COCHIN CHINA FOWLS.**—Thursday, Feb. 10, the sale of the celebrated stock of Cochin China fowls, the property of Thos. H. Potts, Esq., Kingswood Lodge, near Croydon, took place at the Bazaar, Baker-street, Portman-square, by Mr. Strafford, and attracted a numerous and highly respectable company of noblemen and gentlemen from various parts of the kingdom. The prices obtained are a sufficient guarantee of the high estimation in which they were held; 121 birds realized the large sum of £726 1s. 6d., being an average of £6 each bird, many of them chickens only a few months old. The highest price was for the cockerel "Sir Robert," £12, justly described in the catalogue as "matchless in form and colour." This bird won a first prize at the Great Metropolitan Exhibition of Poultry and at Torquay; and the cockerel "Wellington," also a prize bird at those shows, sold for £28 7s. The celebrated imported hen purchased by Mr. Potts of Mr. Andrews (generally considered one of the best hens in this country), although aged, sold for £36 15s. A pullet from her at £22. The hen 102, sold for £25 2s. Other hens and pullets sold as high as £13 13s., £13, £12 15s., £11 11s., £11, £10 10s., £10, and several others brought similar prices. In the following day's sale there were some fine *Dorkings*, the property of Mr. Lewry, of the same stock as the birds shown by him at the recent metropolitan show, and which obtained several prizes. These also brought good prices; and we hope the result of these sales may give a stimulus to the improvement of our domestic fowl.



METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.			WIND AND STATE.		ATMOSPHERE.			WEAT'R.
Day.	8 a.m. in. ets.	10 p.m. in. ets.	Min.	Max.	10 p.m.	Direction.	Force.	8 a.m.	2 p.m.	10 p.m.	
Jan. 24	30.11	30.05	32	42	36	N. East	little	haze	cloudy	cloudy	dry
25	29.83	29.68	32½	42	35	S. Easterly	lively	cloudy	cloudy	cloudy	dry
26	29.64	29.72	31	37	33	N.E., E.	gentle	fine	sun	fine	dry
27	29.75	29.75	28	38	36	S. Easterly	lively	cloudy	cloudy	cloudy	moist
28	29.75	29.80	34	42	36	N. Easterly	ditto	cloudy	cloudy	cloudy	dry
29	29.85	29.84	35	40	36	N. by East	va. & li.	cloudy	haze	cloudy	moist
30	29.83	29.83	34	43	39	W. by South	li., calm	cloudy	fine	cloudy	rain
31	30.10	30.20	29	41	29	Various	calm	fine	sun	fine	dry
Feb. 1	30.20	30.17	25	34	26	Easterly, var.	ditto	fine	sun	haze	dry
2	30.14	30.—	24	42	31	S., S.E.	gentle	fine	sun	cloudy	dry
3	29.72	29.55	31	36	34	Ditto	calm	cloudy	cloudy	cloudy	dry
4	29.53	29.55	32	39	32	E., E. by N.	lively	cloudy	cloudy	cloudy	sleet
5	29.69	29.88	31	39	35	E., N.E.	gentle	cloudy	fine	cloudy	sleet
6	29.88	29.77	34	37	36	Ditto	calm	cloudy	cloudy	cloudy	dry
7	29.51	29.44	34	41	37	S. Westerly	gentle	cloudy	sun	cloudy	dry
8	29.37	29.10	30	38	31	S. East	brisk	cloudy	cloudy	cloudy	dry
9	28.95	29.—	29	40	36	East	l., brisk	cloudy	cloudy	cloudy	dry
10	29.10	29.28	33	34	33	Northerly	lively	cloudy	cloudy	cloudy	rain
11	29.34	29.34	29	34	29	N., N. by W.	gentle	fine	fine	cloudy	snow
12	29.34	29.44	27	32	29	Northerly	ditto	cloudy	cloudy	cloudy	snow
13	29.55	29.66	28	32	29	N. Easterly	various	cloudy	fine	cloudy	snow
14	29.75	29.80	27	34	28	Easterly	gentle	cloudy	fine	cloudy	dry
15	29.80	29.80	21	32	28	S.E., N.W.	ditto	fine	cloudy	cloudy	dry
16	29.80	29.79	26	38	28½	E., N.E.	ditto	fine	sun	fine	snow
17	29.74	29.60	26	33	29	N., N.W.	ditto	cloudy	cloudy	fine	snow
18	29.51	29.50	25	32	28	N. by West	lively	cloudy	fine	cloudy	dry
19	29.50	29.66	18	36	24	Ditto	gentle	fine	sun	fine	dry
20	29.69	29.91	20	33	30	Ditto	lively	fine	sun	cloudy	dry
21	30.03	30.10	27	34	35	Ditto	brisk	fine	fine	fine	dry
22	30.—	29.94	23	34	34	W. by South	gentle	cloudy	cloudy	cloudy	

ESTIMATED AVERAGES OF FEBRUARY.

Barometer.			Thermometer.		
High.	Low.	Mean.	High.	Low.	Mean.
30.82	29.170	30.067	53	21	38.

REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
33.73	28.5	31.12

WEATHER AND PHENOMENA.

Jan. 24 and 25. Damp, chilly; two frosty mornings.—25. Fine and sunny; clouds form, followed by a rainy night.—27. Overcast, with drizzle.—28. Keen, bracing air.—29. Some haze; moist.—30. Fine; the night became rainy.—31. Frost morning and night; day fine and sunny.

LUNATION.—Full moon on the 25th, 5 h. 43 m. morning.

Rain fallen during these 8 days, only 24-100ths of an inch.

Feb. 1. First sharp frost.—2. Haze, clearing off.—3. Cold and cheerless.—4. After wet night, sleet and showery.—5. Wet overnight; then snow, rain; orange sunset.—6. Overcast, and nearly calm.—7.

Fine; cloudy evening.—8. Airy, fine evening.—9. Windy; lull at noon.—10. Much rain overnight.—11. Snowy night.—12. Snow.—13. Snow, but not in quantity.—14. A sun thaw.—15. Veriest night hitherto; overcast and calm.—16. Very gentle air; fine sun; snow, and some on the—17. Thaw all day.—18. Snow early.—19. Fine; very keen.—20. Very keen; a mere hint of snow.—21. Forceful, cold current, lulling after noon.—22. Large flakes of snow, which melts, and is followed by a smart shower.

Rain in February, to the 22nd, half an inch.

LUNATIONS.—Last quarter, 1st day, 6 h. 1 m. morning. New moon, 8th day, 5 h. 34 m. morning. First quarter, 16th day, 3 h. 12 m. morning.

REMARKS CONNECTED WITH AGRICULTURE.—The season having been consistently severe, as the averages will prove, we have little to say. The cold, dry air will have tended to improve the condition of the corn; and, if the gratifying statements of the wonderful effects produced by the conical flour mill be found veracious, a vast improvement in flour must be anticipated. Of progress in the fields, little can be reported or expected. The prospect at present is anything but cheerful.

Croydon.

J. TOWERS.

## AGRICULTURAL REPORTS.

## GENERAL AGRICULTURAL REPORT FOR FEBRUARY.

Notwithstanding that very little progress has been made either in ploughing or sowing, owing to the severity of the weather, agricultural affairs are in a more satisfactory state than when we last wrote. It is true that, up to the present time, not more than one-half of the wheats have been sown, upon the heavy lands; but on light soils, most of the grain has been got in. The plants at one period exhibited a most unpromising appearance, arising from the continuous rains and the saturated condition of the soil. The late sharp frosts have completely checked premature exuberance; and the heavy falls of snow, whilst they have protected the wheats from the chilling effects of the north-easterly winds, are calculated to have a most beneficial effect upon the land. The return of seasonable weather has been productive of an improved sample of wheat. In most of the forward districts, the condition of that grain, both in stack and in granary, was unusually inferior; but within the past few weeks a decided improvement has taken place in it; consequently, the value of most kinds has advanced in proportion to their milling properties. Although somewhat large inroads have been made upon last year's crop, the supplies at this time in the hands of the farmers are undoubtedly good. The demand for wheat may be considered steady; nevertheless, the rise in the quotations has been trifling. Owing to the immense quantities of malt liquors forwarded to Australia, malting barley has been in active request, and really fine parcels have realized 39s. per quarter. In the value of other grain very little alteration has taken place.

The unusually high prices of food in Australia, if we except those of beef and mutton, have induced several parties in the metropolis to ship flour to Port Philip, Sidney, &c. During the month, about 10,000 cwt. have been exported, chiefly the produce of the United States. In addition to the flour, about 5,000 quarters of oats have been forwarded to the same destination.

The cattle trade has continued in a healthy state. In London, as well as in the provincial districts, the quotations of beef, mutton, and veal have risen to some extent, with every prospect of a further advance in them. From Holland we have advices stating that immense numbers of beasts and sheep are in process of fattening, for shipment to England; that disease is by no means common; and further, that the stock about to be forwarded will be of a much heavier weight than usual.

The wool trade has been rather excited. Both English and Colonial quantities have risen fully 1d. per lb., and large quantities of the former have changed hands for shipment to the Continent and the United States. It may be remarked that the continental clothiers are now preferring English to Sidney wool—owing, we presume, to the great difference in price, and the keen competition on the part of the home-manufacturers to obtain colonial parcels suited to their respective wants. The public sales have passed off remarkably well, and nearly the whole of the supply offered (about 35,000 bales) has been taken for home use.

There has been rather more doing in hay and straw, the prices of which have shown a tendency to advance. Meadow hay has realized £2 15s. to £4 10s.; clover do., £3 15s. to £5; and straw, £1 4s. to £1 13s. per load. The last cut of meadow hay is proving good.

Generally speaking, the provision trade has continued active. Fine new-milk Dorset butters have sold in the Metropolis as high as 114s. per cwt.; bacon has been in request; whilst barrel beef and pork have risen fully 10s. The Australian shipping has taken off unusually large quantities. The carrot and turnip crops having proved large, and of very fine quality, the winter stock of hay has been found larger than some parties have had occasion for. As regards potatoes, we may observe that their condition has continued very inferior; hence, really good qualities have realized 150s. per ton. From abroad, the imports have amounted to about 6,000 tons, chiefly from Calais, Dunkirk, and Rouen.

In Ireland and Scotland, the trade with fat stock, corn, &c., has been tolerably firm; and in some instances prices have slightly advanced. The stocks of grain on hand are represented as seasonably large. In the Scotch grazing districts, beasts have fattened remarkably well; and we perceive that the supplies forwarded to the south have exceeded those of some former seasons to some extent.

## REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

The present position of the cattle trade is calculated to have considerable influence upon value for some time hence. In former impressions, we have alluded to what may be fairly termed the false position of the graziers, and condemned the until lately persevered in system of disposing of stock in a half-fat state, and frequently of an age which has never adequately repaid either the producers or

butchers. The system, as we long since predicted would be the case, is now telling upon us. In nearly the whole of the markets held since we last wrote, but more especially in Smithfield, the supplies of sheep on offer have been unusually small, and for the most part in very middling condition. The consequence is that prices have continued to rise, with every prospect of a further improvement in them as the season advances. The free-trade party are, of course, perfectly satisfied with what they term the truth of the principles they have so long advocated; but the fact is, free trade has produced the present state of things; in other words, it induced numbers of flock-masters, shortly after the passing of the tariff, and when the quotations were unusually low and unremunerative, to sell largely at almost any quotations, in order to pay their way. The consequence is that great inroads have been made upon the supplies of sheep in the country, and some difficulty is experienced in meeting the present increased consumption. We believe we are correct in stating that a smaller number of sheep is to be met with on almost every farm in England than during the past ten years. Of course every effort is being made by those immediately interested to meet the requirements of the trade. Oil-cake is being largely consumed in most quarters, and the imports from the continent continue good and of improved weight; but the rapid extension of our commercial operations, and the increased employment thus afforded our artisans and others, together with the rise in the rates of wages, seem to forbid any supposition that prices can recede below their present level. As regards beasts, the deficiency in the supplies is not so apparent; nevertheless it is quite clear that there is every chance of a good and profitable return to their owners, especially as very few serious cases of disease have presented themselves for some time past.

The rearing of calves in Essex and Surrey appears to be almost wholly neglected, notwithstanding that the prices of veal have been tolerably remunerative. The metropolitan demand is now almost wholly met by dealers in the west of England, and by the Dutch graziers. The pork trade has not received that stimulus which might have been expected from the rise in the value of beef, mutton, and veal; nevertheless the quotations have ruled firm.

The abundant supplies of food for winter use have been of great service to the stock, nearly the whole of which has been confined in yards and closes, owing to the tender condition of the soil, and the heavy falls of snow. The turnip and beet crops have turned out remarkably fine. The lambing season, up to the present time, has not been

very satisfactory. In some districts the losses have been severe; but, generally speaking, they have not exceeded many former years. The demand for English wool, both for home and foreign use, having improved, the value of sheep skins has been on the advance, and heavy polled have sold as high as 10s. each.

The total supplies of stock exhibited in Smithfield have been as follows:—

	Head.
Beasts.....	19,308
Cows.....	470
Sheep.....	86,910
Calves.....	2,098
Pigs.....	2,420

COMPARISON OF SUPPLIES.

	Feb.	Feb.	Feb.	Feb.
	1849.	1850.	1851.	1852.
Beasts....	17,139	16,727	17,393	18,797
Cows....	617	445	324	433
Sheep....	81,050	80,160	91,568	95,306
Calves ..	1,240	998	1,381	1,503
Pigs....	1,247	1,819	2,340	2,439

The bullock supplies have been thus derived:—

	Head.
Norfolk, Suffolk, &c. ....	8,950
Other parts of England .....	2,300
Scotland .....	3,100

The prices of beef have ruled from 2s. 8d. to 4s. 2d.; mutton, 3s. 10d. to 5s. 2d.; veal, 3s. 2d. to 4s. 10d.; pork, 2s. 10d. to 4s. per slbs., to sink the offals. The few lambs on offer have realized 4s. 6d. to 5s. per slbs.

COMPARATIVE PRICES.

	Feb. 1849.		Feb. 1850.	
	s. d.	s. d.	s. d.	s. d.
Beef from....	2 8	to 3 8	2 8	to 3 8
Mutton .....	3 0	to 4 6	3 0	to 4 6
Veal .....	3 8	to 5 8	3 0	to 3 10
Pork .....	3 4	to 4 6	3 2	to 4 0
	Feb. 1851.		Feb. 1852.	
	s. d.	s. d.	s. d.	s. d.
Beef from....	2 4	to 3 8	2 2	to 3 8
Mutton ...	3 4	to 4 6	2 8	to 4 4
Veal .....	3 0	to 4 0	3 0	to 4 2
Pork .....	2 10	to 4 0	2 6	to 3 10

An unusually wide margin has existed between the value of sheep in and out of the wool, the difference being not less than one shilling per stone; that is to say, Downs in the wool have sold at 5s. 2d., out of the wool 4s. 2d. per slbs.

The annexed imports of foreign stock have been reported into London:—

	Head.
Beasts.....	2,034
Sheep.....	8,862
Lambs.....	10
Calves.....	1,482
Pigs.....	45

Total.....	12,433
Corresponding month in 1852....	9,123
Do. do. 1851....	11,828
Do. do. 1850....	3,880
Do. do. 1849....	5,642
Do. do. 1848....	3,546
Do. do. 1847....	3,946

Several importations have taken place at the outports, amongst which we have observed the arrival of 140 oxen from Spain, at Southampton.

Newgate and Leadenhall markets have been seasonably well supplied with country-killed meat ;

yet the general demand has ruled steady, and prices have had an upward tendency. Beef has sold at from 2s. 6d. to 3s. 6d.; mutton, 3s. 4d. to 4s. 6d.; veal, 2s. 8d. to 4s. 8d.; pork, 2s. 8d. to 4s. per 8lbs., by the carcass.

## REVIEW OF THE CORN TRADE DURING THE MONTH OF FEBRUARY.

From the end of October till the close of January we had almost constant wet weather, causing extensive inundations in many parts of the country, and rendering it impossible to finish wheat sowing at the accustomed period. Since the commencement of the present month the weather has undergone a complete change. At first we had slight night-frosts, and ploughing and sowing, so long delayed, were actively resumed: a considerable quantity of work was consequently done by the middle of the month; but subsequently the frost increased in intensity, and field labours were again interfered with; but the alteration from wet to dry frosty weather must have proved highly beneficial. Since we last addressed our readers we have continued our inquiries with a view to ascertain as nearly as possible the breadth of land under wheat culture; and we are inclined to think that the estimate we then ventured to give was not far from correct, viz., that owing to the extreme wetness of the autumn and early part of the winter, about one-fourth of the land intended for this grain had not been seeded at the end of January. The probability of a higher range of prices than we have been accustomed to of late years will no doubt stimulate growers to extra exertion, and cause a good deal of wheat to be sown in spring; and it is therefore possible that the total breadth of land under this crop may, after all, not fall materially short of what it would have been if the seed time in autumn had proved less inauspicious. There will, however, still be the disadvantage which naturally attaches to spring sowing—the crop is rarely as productive as that raised from seed committed to the soil at the regular period; and it is besides more susceptible of injury from various causes. It is yet too early to say much as to what may have been the effect of so much rain on the seed in the ground; on well-drained lands it may have received no positive injury, but in many localities it must have suffered; and we think there are sufficient grounds to view the future, as far as the next wheat harvest is concerned, with some apprehension. Under these circumstances, and with the positive knowledge that the last crop in this country was greatly inferior in quality, and somewhat deficient in quantity, to the produce of good average years, it is not

by any means surprising that the prevailing impression should be in favour of a higher range of prices. Still the trade has since the beginning of the present year taken quite a different turn to what was expected. Throughout January business was very dull, and the value of wheat gradually gave way at all the principal markets in the kingdom, till 3s. to 4s. per qr. of the advance established in November last was lost. Latterly, a firmer tone has been assumed by holders, and about half of the decline has again been recovered; this has, however, been accomplished with much difficulty, purchasers having acted throughout with the utmost caution. The primary cause of the want of confidence has unquestionably been the uncertainty felt as to the capabilities of foreign countries to furnish supplies.

Since the commencement of free-trade in corn, the arrivals from abroad have been on so liberal a scale as always to exceed what has been for the time needed, and this has naturally led to the belief that, however great our wants may prove, adequate supplies will be forthcoming. Whether this theory will prove correct during the ensuing summer remains to be seen; but for the present, at all events, we are not likely to be overwhelmed with supplies. The autumn shipments from the Baltic, so long delayed by contrary winds, reached us in January. The quantity did not, on arrival, prove quite so large as expected; and most of the factors receiving the same, thinking favourably of the future course of the trade, preferred landing to forcing sales from on board ship. The northern ports of Europe are now closed by ice, and no further consignments from that quarter can be expected to reach us till May. Of the late arrivals, a considerable proportion has already gone into consumption, and that remaining is in general in firm hands. In France and the nearer ports in the Mediterranean, from whence immediate shipments would be practicable, prices are relatively higher than in our markets, and the quantity likely to be derived from thence will not be large. We have therefore only the Black Sea ports and America to depend on for supplies during the next two months. The quantity of wheat on passage from Southern Russia, Egypt, &c., is variously estimated: the best

authorities reckon it at about 500,000 qrs. This quantity is not very large when we consider that the average importations into the United Kingdom of foreign wheat have amounted per month for a long time past to 400,000 to 500,000 qrs. Respecting the probable supply of flour from America there is no very accurate data; but the fact that the imports from thence have latterly lost money, and that there is at present no margin for profit on consignments from the other side of the Atlantic to England, may lead to the conclusion that no very great quantity will in the first instance reach us from thence. We are therefore inclined to think that our growers have less to apprehend from foreign competition during the next two or three months than has been the case at any previous period for a long time past, and we certainly anticipate some improvement during that interval in the value of wheat. How quotations may range subsequently it is at present impossible to foresee—much will depend on the character of the season; if it should hereafter be discovered that the extraordinary weather experienced during the autumn and winter had done serious mischief to the wheat plant, even large importations from abroad might fail to prevent prices rising; but we trust that this may not prove the case, as we consider that a large home produce is the only chance our farmers have of competing with the foreign growers.

The hope entertained, in consequence of the decrease in the virulence of the potato disease for some years past, that the disorder was gradually disappearing, has proved fallacious. The loss last autumn is now admitted on all hands to have been greater than in any preceding season except the fatal year 1846. The scarcity of this root sufficiently proves the fact: as a general article of food it has long been beyond the reach of the poorer classes, and the consumption of bread has increased proportionately; we are therefore inclined to think that greater inroads have been made in the last crop of wheat than is usually the case at the corresponding period of the year; indeed this appears also to be borne out by the extent of the deliveries from the growers, which have ever since harvest been on a liberal scale. The increase in the consumption is further proved by the fact, that with large imports from abroad, stocks of foreign wheat and flour, in the warehouses at all the leading ports in the kingdom, have diminished. Ireland has been compelled to draw large supplies of bread-stuffs from this side of the channel; and by far the greater proportion of the wheat, and nearly the whole of the Indian corn, which has been received from ports east of Gibraltar, has been taken for Irish account.

Business at Mark-lane has not been particu-

larly active at any period since we last addressed our readers. There has not been the slightest disposition to enter into speculative investments; and those who have bought for consumption have declined to purchase more of any article than they needed for immediate use. The feeling has been all along in favour of an improvement; but this impression has not been sufficiently strong to induce buyers to act freely.

The arrivals of wheat coastwise into the port of London have not been large, having scarcely averaged 4,000 qrs. per week. The greater proportion of the supply has come to hand in indifferent condition, notwithstanding the prevalence of frosty weather. To this circumstance may be attributed in some measure the extreme caution which the millers have exercised in making purchases. The value of really fine dry wheat has crept up 1s. per qr., in some cases perhaps a little more; but prices in general have undergone too slight a change to warrant alteration in quotations. The principal town millers have lately taken so little English wheat off the market as to lead to the belief that their stocks must have become reduced into a very narrow compass, and though it is quite possible that the change which has taken place in the weather since the 22nd inst. may have the effect of shaking the slight tendency to advance which prices exhibited on Monday, still the prevailing opinion is that unless supplies increase materially our quotations will not give way.

We have not received much wheat from Lincolnshire, Cambridgeshire, and that neighbourhood; supplies from thence having been directed to the northern markets, where better prices have been obtained than could have been realized at Mark-lane.

Since the close of last month only 23,000 qrs. of wheat have arrived from abroad in the port of London, and the wind having during the greater part of the time been as favourable as could be desired for vessels from the northern continental ports, it is plain that all shipped previous to the setting-in of the frost must have reached our shores. We may consequently calculate with tolerable certainty on short supplies from that quarter for several weeks to come. This has tended to render holders of granaried samples very firm, and they have manifested a decided disposition to raise their pretensions. Purchasers, on the other hand, have been exceedingly loath to give credit to the reported probability of short supplies, and have acted as if they had no intention or desire to add materially to their stocks. Business has therefore been more firm than brisk, and sellers have experienced great difficulty in obtaining any advance on previous prices. Our market has been visited from time to

time by country millers, but they have confined their operations to a narrow circle: this has also been the case with the town trade; and we cannot report a single day during the entire month on which the sale has been extensive. The prices which needy buyers have had to pay have, however, been a trifle higher the last week or two than those previously current; and holders seem to reckon with as much confidence as ever on some further improvement.

Very few arrivals have taken place off the coast, of cargoes of Black Sea and Mediterranean wheat, since our last: the knowledge that a large fleet of vessels must be pretty close at hand has acted as a check to speculation, and the operations in this branch of business have been of less importance than usual. Cargoes on passage have been offered more pressing than they were last month, and buyers have had the turn in their favour. The Greek merchants, who have the trade with the Black Sea almost exclusively in their hands, appear determined to afford buyers all the facilities possible; and there are several highly-respectable firms in London willing to contract to deliver certain qualities of wheat, at a given time and given price, on receiving a deposit from the buyer, allowing the latter the option of taking the goods or not, as he may feel disposed, on condition that if the buyer should consider it best not to let the wheat come forward, the deposit-money is to become the property of the seller. This is quite a new feature in the trade, and will no doubt have its attractions for speculators, who can thus limit their loss, whilst they have the chance of the profit a rising market might give.

The sale of flour has increased in extent since the end of last month. All through January the London bakers bought very sparingly, and allowed their stocks to run somewhat low. The increased firmness which the wheat market has since assumed has induced a better demand, but no alteration has taken place in the top price. Country flour has gradually crept up about 1s. per sack from the lowest point of depression, owing to short supplies. The receipts of this article from America have been quite trifling; but having previously a fair quantity in warehouse, which holders have been rather anxious to realize, buyers have experienced no difficulty in purchasing at previous prices, say for sweet Western Canal, Ohio, &c., 26s. to 27s., and fine Baltimore 27s. to 28s. per barrel. Of sour flour, some rather large sales have been made at 24s. per barrel—a price at which it could certainly not be imported.

The supply of English barley has scarcely sufficed to satisfy the demand. A very large proportion of what has come to hand has consisted of

secondary and ordinary qualities; really fine malting parcels have been very scarce, and have consequently commanded full terms, 36s. to 37s. having been readily paid, and in some cases as much as 38s. per qr. The common descriptions have been relatively cheaper, but the value of the latter has, on the whole, had a tendency to advance. In the early part of the month a few thousand quarters of this grain were received from foreign ports, principally Danish, hardly good enough for maltsters or distillers, but excellent for grinding purposes. For good heavy parcels 28s. to 29s. per qr. has been paid for grinding, and these rates are still obtainable.

No actual alteration has taken place in the value of malt, but buyers have found it difficult to secure the finer descriptions at previous prices.

The last week in January, and the first in the present month, we received very liberal supplies of foreign oats; since then, however, the receipts from abroad have been exceedingly small. The arrivals coastwise have throughout been on a very moderate scale. The same dulness which we have had to notice for several consecutive months has continued to prevail in the oat trade, and one would be almost inclined to think that the consumption of the metropolis must have decreased. The principal dealers have, at all events, manifested no inclination to purchase largely, and former terms have barely been supported. Scotch oats of capital quality, weighing 41 to 42 lbs. per bushel, have been sold at 20s. to 22s., Irish at corresponding rates, and foreign feed at all kinds of prices, from 16s. up to 22s. per qr., according to quality. Those who bought Russian oats at 20s. 6d. per qr. two or three months ago, in expectation of a rise, have never had a chance to re-sell, the price being now just the same as then.

Beans have, notwithstanding the frost and moderate supplies, moved off sparingly, and very good new pigeon were offered on Monday at 36s. per qr. Egyptian beans have remained perfectly stationary in value, with a retail demand.

The frost caused a slightly increased consumption of peas; but the inquiry for this article has not at any period of the month been active. On Monday last fine boilers were obtainable at 40s. to 42s., and other sorts at proportionate rates, with more sellers than buyers.

There has been less doing in floating cargoes of Indian corn than usual; there was a temporary revival in the demand about the middle of the month, without, however, leading to much business; and during the last eight or ten days, increased anxiety has been shown by sellers to realize. The arrivals off the coast have been small, but there have been plenty of offers of cargoes on pas-

sage, or to be shipped in spring. The tendency of prices has, on the whole, been downwards, and the turn has been decidedly in favour of the buyer.

The tone of the grain trade abroad has, as usual, been materially influenced by the advices from hence. The dulness which prevailed here in January, and the greater part of this month, has led to a similar state of inactivity at the leading continental markets; still, holders there seem to cherish the notion that Great Britain will sooner or later require extensive supplies, and prices have consequently been tolerably well maintained.

An immense fall of snow took place about the middle of the month, in all the northern parts of Europe, causing the roads to become blocked up, and interfering with the transit of supplies of grain from the rural districts to the consuming towns. The frost has been sufficiently severe to cover the various rivers and harbours with ice, and by the latest reports from the Baltic we learn that a complete stop had been put to shipments of corn. The season is, however, now so far advanced that it is scarcely to be expected that the impediment will be of long duration; still we cannot calculate on consignments reaching this country from the Baltic ports much before May. Prices in that quarter have been quite as well supported as on this side, and the recent firmness in the wheat trade in London and some of the Yorkshire markets appears to have sufficed to impart renewed confidence to holders abroad. Stocks do not seem to be by any means heavy there, and it is certain that it would require but little encouragement to cause sellers to raise their pretensions.

Letters from Danzig, of the 19th inst., state that the somewhat improved tone of the London advices had occasioned a small advance in prices of wheat, and the finer kinds of high-mixed were not then obtainable below 51s. to 53s. per qr. These are high prices, and as freights are likely to be high at the opening of the navigation, it will certainly not pay to import from thence if quotations do not improve here.

The same may be said respecting the Lower Baltic ports; prices are everywhere higher than in the English markets, and the chances are that those who import will do so at a loss. Good wheat has not been sold at any period of the month at Rostock below 44s., and the latest quotations from thence are 45s. to 46s. for 61½ to 62lbs. quality, free on board in spring.

At Wismar, Griefswald, Anclam, and other ports from which similar qualities of wheat are imported, prices are equally high. What the rate of freight may be cannot be said at present—probably 3s. 6d. to 4s. 6d. per qr. This, added to the price on board, insurance, and other charges, will

bring the cost here some shillings per qr. above the present value of the article. This state of things is not encouraging for importers; still we have no doubt that the surplus stocks will find their way to this country; it has been so in every preceding season since our ports have been open, and there is certainly more ground at present for believing that England will need larger supplies than has been the case on any previous occasion for some time past.

At the near continental ports quotations have been very steadily supported since we last addressed our readers; indeed, the tendency has during the last fortnight been upwards at Hamburg, and at Rotterdam and Amsterdam.

We have similar accounts from France. Early in the month there were some prospects of supplies of flour reaching us from the latter country; but the late rise there, and the dulness which has characterized the trade the last few days, will, we think, prevent shipments being made to England.

At most of the Mediterranean ports prices of wheat are relatively higher than at places nearer home; hence the advices from that quarter possess little interest.

In the Black Sea a calm appears to have succeeded to the previous activity, and at Odessa, Galatz, and Ibraila, business was quiet, according to the most recently-received reports.

The latest accounts from America report a revival in the demand for flour; and at New York rather large purchases appear to have been made about the close of January, for shipment to Great Britain; and we may reckon upon receiving a fair quantity of bread-stuffs from the other side of the Atlantic so soon as we shall have experienced an interval of westerly wind.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter	
WHEAT, Essex and Kent, white, new..	43 to 47	fine up to 52
Ditto ditto old ..	44	52 " 59
Ditto ditto red, new...	42	45 " 47
Ditto ditto old ...	44	48 " 52
Norfolk, Lincoln, & Yorksh., red..	42	47 " 52
Ditto ditto new ...	37	44 " 46
Ditto ditto white new, none		" —
Ditto ditto old none		" —
BARLEY, malting, new .....	30	32
Chevalier .....	35	38
Distilling .....	28	30
Grinding .....	26	28
MALT, Essex, Norfolk, and Suffolk, new	54	55 extra 58
Ditto ditto old	52	54 " 56
OATS, English feed.....	16	19 fine 21
Ditto Potato.....	19	21 extra 23
RYE.....	28	30 old 28 30
BEANS, Mazagan.....	33	34 " 31 35
Ticks.....	34	36 " 36 38
Harrow.....	35	37 " 37 39
Pigeon.....	36	40 " 40 44
PEAS, white boilers.....	38	42 " 37 40
FLOUR, town made, per sack of 280 lbs.	—	— " 41 46
Households, Town 40s. Country	—	— " 36 40
Norfolk and Suffolk, ex-ship	—	— " 34 35

FOREIGN GRAIN.

	Shillings per Quarter	
WHEAT, Dantzic, mixed. . . . .	46 to 47	high mixed 49 51 extra 57
Konigsberg . . . . .	45 47	48 50 „ 51
Rostock, new . . . . .	48 50	fine old 47 49 „ 53
Pomera, Meckbg., and Uckermk., red . . . . .	46 48	extra 48 50
Silesian . . . . .	41 46	white 46 48
Danish and Holstein . . . . .	42 44	„ 41 46
Rhine and Belgium . . . . .	42 45	old 45 49
French . . . . .	42 44	white 43 47
Odessa, St. Petersburg and Riga . . . . .	37 39	fine 41 43
BARLEY, grinding . . . . .		26 28
Distilling . . . . .		27 30
Malting . . . . .		none —
OATS, Dutch, brew, and Polands . . . . .		19 22
Feed . . . . .		18 21
Danish and Swedish feed . . . . .		19 21
Stralsund . . . . .		19 23
Russian . . . . .		20 21
French . . . . .		18 20
BEANS, Friesland and Holstein . . . . .		32 35
Konigsberg . . . . .		34 37
Egyptian . . . . .		30 32
PEAS, feeding . . . . .	35 36	fine boilers 38 40
INDIAN CORN, white . . . . .	32 35	yellow 32 35
FLOUR, French, per sack . . . . .	36 38	fine 38 42
American, sour per barrel . . . . .	23 25	sweet 26 28

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS.

WEEK ENDING:	Wheat.		Barley.		Oats.		Rye.		Beans.		Peas.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Jan. 8, 1853. . . . .	46	0	29	8	18	6	29	1	34	8	32	5
Jan. 15, 1853. . . . .	45	10	29	10	18	7	30	8	34	8	30	7
Jan. 22, 1853. . . . .	45	8	30	5	18	7	32	5	34	11	31	9
Jan. 29, 1853. . . . .	46	0	31	2	18	7	32	2	34	9	31	10
Feb. 5, 1852. . . . .	46	1	31	8	18	7	31	11	34	7	31	5
Feb. 12, 1853. . . . .	45	2	31	5	18	5	30	11	34	10	31	9
Aggregate average of last six weeks . . . . .	45	9	30	8	18	6	31	2	34	9	31	8
Comparative ave. same time last year . . . . .	39	9	28	4	18	4	28	9	28	9	28	9
DUTIES . . . . .	1	0	1	0	1	0	1	0	1	0	1	0

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last Friday's Gazette.			Averages from the correspond ing Gazette in 1852.		
Qrs.	s. d.	Av.	Qrs.	s. d.	Av.
Wheat . . . . .	79,428	45 2	Wheat . . . . .	90,835	42 8
Barley . . . . .	81,347	31 5	Barley . . . . .	83,478	30 7
Oats . . . . .	21,672	18 5	Oats . . . . .	27,228	18 9
Rye . . . . .	176	30 11	Rye . . . . .	118	29 11
Beans . . . . .	6,397	34 10	Beans . . . . .	7,158	29 10
Peas . . . . .	2,561	31 9	Peas . . . . .	2,535	29 7

PRICES OF SEEDS.

BRITISH SEEDS.

Linseed (per qr.) . . . . .	sowing 54s. to 58s.; crushing 45s. to 50s.
Linseed Cakes (per ton) . . . . .	£8 0s. to £9 10s.
Rapeseed (per last) new £22 to £23, fine £24, old £21 to £24	
Ditto Cake (per ton) . . . . .	£4 10s. to £5 0s.
Cloverseed (per cwt.) . . . . .	44s. to 64s.
Mustard (per bushel) new, white 7s. to 9s., brown 7s. to 9s.	
Coriander (per cwt.) . . . . .	old 9s. to 12s.
Canary (per qr.) . . . . .	38s. to 42s.
Tares, Winter, per bush, 4s. 6d. to 5s. . . . .	Spring (nominal)
Carraway (per cwt.) . . . . .	new 46s. to 47s.; fine 48s.
Turnip, white (per bush.) . . . . .	Swede (nominal).
Trefoil (per cwt.) . . . . .	26s. to 30s.
Cow Grass (per qr.) . . . . .	(nominal) . . . . . 00s. to 00s.

FOREIGN SEEDS &c

Linseed (per qr.) . . . . .	Baltic, 43s. to 46s.; Odessa, 45s. to 49s.
Linseed Cake (per ton) . . . . .	£7 10s. to £9 10s.
Rape Cake (per ton) . . . . .	£4 10s. to £5 0s.
Hempseed, small, (per qr.) 38s. to 42s., Do. Dutch, 40s. to 44s.	
Tares (per qr.) . . . . .	old, small 25s. to 30s., large 30s. to 32s.
Rye Grass (per qr.) . . . . .	28s. to 35s.
Coriander (per cwt.) . . . . .	(none) 00s. to 00s.

AN ACCOUNT SHEWING THE QUANTITIES OF CORN GRAIN, MEAL, AND FLOUR, IMPORTED INTO THE UNITED KINGDOM IN THE MONTH ENDED 5TH FEBRUARY, 1853, 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.	
Wheat, from British Possessions . . . . .	159 4	159 4	1 2	
Barley, do. . . . .	427 4	427 4	—	
Peas, do. . . . .	1 9 6	1 9 6	—	
Beans, do. . . . .	0 4 0	0 4 0	—	
Wheat, foreign . . . . .	440742 7	441519 2	1387 4	
Barley, do. . . . .	73690 3	73690 3	15 5	
Oats, do. . . . .	80434 1	80434 1	24 0	
Rye . . . . .	4174 0	4174 0	—	
Peas, do. . . . .	12632 2	12632 2	—	
Beans, do. . . . .	41473 5	41473 5	30 7	
Maize or Indian Corn, do . . . . .	95924 7	95924 7	—	
Buckwheat . . . . .	567 2	567 2	—	
Malt . . . . .	—	—	—	
Beer or Bigg . . . . .	600 0	600 0	—	
Flour from British Possessions . . . . .	133 0 2	133 0 2	6 3 18	
Flour, foreign . . . . .	305487 1 7	305487 1 7	7 2 26	

HOP MARKET.

BOROUGH, MONDAY, February 21.

Fine Hops are in very limited supply, and continue to be inquired for at improving rates. In old Hops also we have a fair demand.

Mid and East Kents . . . . .	95s. to 160s.
West of Kents . . . . .	95s. „ 112s.
Sussex Pockets . . . . .	95s. „ 112s.

POTATO MARKET.

SOUTHWARK, WATERSIDE, MONDAY, Feb. 21.

Since our last report the supply has been limited, still the trade continues heavy, and, with the exception of French Whites, there is little alteration in prices.

The following are this day's quotations:—

York Regents . . . . .	per ton 90s. to 140s.
Lincolnshire ditto . . . . .	75s. „ 110s.
Scotch ditto . . . . .	85s. „ 105s.
Ditto reds . . . . .	75s. „ 85s.
French whites . . . . .	80s. „ 95s.
Dutch . . . . .	65s. „ 70s.

WOOL MARKETS.

LIVERPOOL, FEB. 19.

SCOTCH.—The inquiry is still good for all kinds of Scotch, but the stocks being exceedingly light the business is limited, at very full rates.

	s. d.	s. d.
Laid Highland Wool, per 24lbs. . . . .	12 6	13 6
White Highland do. . . . .	15 6	16 6
Laid Crossed do. unwashed . . . . .	14 0	16 0
Do. do. washed . . . . .	15 0	17 0
Laid Cheviot do. unwashed . . . . .	16 0	18 0
Do. do. washed . . . . .	19 6	22 0
White Cheviot do. do. do. . . . .	26 0	30 0

FOREIGN.—The attention of the trade is principally engaged with the public sales now progressing favourably in London. There is consequently, with our limited stock, little doing here by private contract.

ERRATA IN OUR LAST.

In the description of the plate in our last, for "Hereford Bull" read "Devon Bull," and for "Stowey Court, near Leominster," read "Stowey Court, near Bridgwater, Somerset."











# THE FARMER'S MAGAZINE.

APRIL, 1853.

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## PLATE I.

### A NORTH DEVON OX,

THE PROPERTY OF THE EARL OF LEICESTER, HOLKHAM, NORFOLK;

For which the first prize of twenty-five sovereigns was awarded in Class 2, at the Smithfield Club Cattle Show, December 1852; the Earl of Leicester also taking the silver medal as the breeder. This ox was bred at Holkham. His sire was "Barton," a highly-bred pure North Devon bull, from the celebrated herd of Mr. George Turner, of Barton, near Exeter; his dam a very favourite cow in the Holkham Dairy, and the parent of many excellent animals. He had a very great aptitude to fatten, and was not put up until many weeks after several others that were far behind him when the show day arrived.

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## PLATE II.

### L E V I T Y,

A BROOD MARE, THE PROPERTY OF J. C. COCKERELL, ESQ.

Levity, a brown mare, bred by Mr. G. Walker in 1831, was got by Chateau Margaux, out of Helga (bred by Sir C. Bunbury in 1816) by Smolensko; her dam by Stamford, out of sister to Spadille, by Highflyer.

Chateau Margaux, bred by Lord Egremont in 1822, was by Whalebone, out of Wasp (sister to Scorpion) by Gohanna. He was sent to Virginia, United States, in 1834.

Levity threw her first foal, Almeade, in 1839.

Queen Elizabeth, the filly at her foot, was one of the last of the stock of Mr. Theobald's celebrated Cancell. She was foaled in 1843, and is now in Mr. Bruhl's stud.

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## PEAT CHARCOAL: ITS PECULIAR APPLICABILITY.

BY J. TOWERS, MEMBER R.A.S., H.S. OF LONDON, ETC.

The serious epidemic which prevailed in and around Croydon, during the late autumn, and attained its utmost virulence in the Christmas week (coincidentally, strange to say, with the highest flow of the insidious river Bourn), attracted my serious attention to the chemical qualities of carbonized peat, generally termed "peat charcoal." Great efforts have been made, by some parties, to cast a slur upon the sanitary measures adopted by our Local Board of Health, in order to carry off the sewage drainage of the town and its extensive suburbs, and to conduct a large portion of this offensive matter to an erection called a filterer, made with a view of separating its fluids from the more solid matters, which it was hoped might prove to the farmers a most valuable manure, equal, or little inferior, to fine imported guano.

The deposit thus existing in the filterer has become the cause of much offence to those who believe that fermenting sewage tends by its foul odour to produce disease and epidemic fever. Whatever may be the exciting or proximate cause, certain it is that malaria, such as has been known for centuries to produce agues and fevers, frequently exists without emitting any sensible foul odour; whereas it is frequently a fact that there are certain offensive trades, and localities wholly independent of such trades, wherein thousands of persons constantly reside, and yet remain unaffected by any specific disease whatsoever. The weather has been altogether peculiar during the greater part of the late summer, autumn, and winter; and therefore, dismissing the attempt to discover causes, but considering that foul odour and offensive smells are

unqualified nuisances, and bearing in recollection the laudits bestowed by Mr. Jasper Rogers—the apostle of peat and its corrective qualities, when applied to sewage—no sooner had I ascertained that peat was extensively used in our filterer, than I hastened to obtain a supply of the article sufficient in quantity to furnish the means of carrying through a series of analyses, which could scarcely fail to discover every quality that might be available as a *deodorising disinfectant*.

Some time ago Dr. Anderson, chemist to the Highland Society, wrote a very instructive article, which appeared in its Transactions (*Journal of Agriculture*, March, 1851). Of this, some notice was taken in "The Farmers' Magazine," October 1, 1852; and, therefore, I shall not now recapitulate further than to state that Dr. Anderson proved by conclusive evidence that peat-charcoal is unable to absorb or fix ammonia, and therefore could be of no avail either in retaining the ammonia which exists in sewage, or effecting its combination with the solid portions left in the filterer. Now, ammonia has long been esteemed one of the best fertilizers, as the fruitful source of *nitrogen*; while its fixation by all loamy earths, adequate to bring a *cerial* or even a *turnip* crop to perfection, has been proved by every recent experiment on the absorbent powers of sound loams. Peat-charcoal, therefore, permits all the ammoniacal fluid of urine to pass through it, leaving the solid portions to remain comparatively effete and worthless. As a *deodoriser* of the foulest and most fetid manure, I fully admit its efficiency; and in this admission Dr. Anderson also concurs. Therefore it now becomes a duty to give some account of the following processes, which have enabled me to ascertain, to a certain extent, what result may be anticipated from a judicious use of peat-carbon, as applied for purposes of agriculture.

First then, when a body of it, in a filtering vessel, is repeatedly washed with simple rain-water, till several ounces of clear and pellucid droppings are collected, the fluid is found so *hard* as instantly to curdle a spirituous solution of Castile soap. Though void of *smell*, its taste is heavy and peculiar; and when tested by nitrate or acetate of baryta, it yields abundance of barytic sulphate. Nitrate of silver throws down the curd-like muriate of that metal, and the presence of much lime is proved by oxalate of ammonia. These simple experiments proved the compound nature of this carbon; but they led to still further curious results, for the same portion that had thus been deprived of its constituents soluble in water effectually deodorised many ounces of fetid and urinous manure poured upon, and then stirred into, the surface of peat in filter; while a com-

parative experiment with fresh *dry peat* in another filter, and a like quantity of the foul manure, produced several ounces of clear filtrate, abounding with lime, sulphuric and hydrochloric acid; and in addition, the *yellow granular platinum chloride* of ammonia, demonstrative of the *non-retention* of that volatile alkali by peat carbon. Pure liquid ammonia (spec. gravity about 0.97) poured in liberal quantity upon a surface of dry peat, and left for a time to penetrate to nearly its entire depth, was not deprived of its ammoniacal pungency. Upon adding clear rain-water till drops fell into the receiving-vessel, the fluid thus filtrated retained every quality of the original ammoniacal liquor; thus proving the correctness of Dr. Anderson's first-reported experiment upon *Scotch peat-charcoal*. Experiments with foul putrid urine are in progress, but not so advanced as to claim other notice than that of the deodorising power of peat, and the absorption of the organic and colouring principle of the urine.

The season for potato-planting is come. Eight entire seasons have elapsed since that valuable tuber was first assailed by the epidemic termed "the murrain and potato-rot." This disease appears to be really on the decline, since the *quality* and *keeping* of the tubers on sale during the winter have proved the fallacy of autumnal alarmists, and also that the loss of the haulm, in and after August, affords no certain criterion of final decay in the stores. Were those winter depositaries free from damp, of a low but equable temperature, and the potatoes surrounded with carbonaceous substance, in place of those vegetable putrescent matters which promote and keep up the processes of exhaustion and decay, a complete cure might be rationally anticipated. However, it is admitted on all hands that a light, open, rather sandy earth, is most favourable to the potato. Witness the "Agriculture of Cornwall," in the *Royal Agricultural Journal*, vol. vi., alluded to in the *Mark Lane Express* of March 14th last. Mr. Cuthill, the successful grower of the ash-leaved, and more recently of the new variety named the Lapston kidney, has urgently recommended wood and coal ashes, charcoal, and other carbonized matters, in planting, as having proved their efficacy in warding off disease. As I have discovered the potency and invariable success of the peat-charcoal used here in destroying the foul odour and flavour resulting from putrescent fermentation, I would strongly urge, that, without any exception, every early or late variety of potato be surrounded in the furrows with charcoal of wood or peat, before covering them with earth. And here again I must regret the high price that the manufacturers of Irish peat have imposed upon their article, and which amounts to

almost a prohibition of its use in the great way. Let no one suppose, however, that the security from disease would depend upon the absorption of

ammonia; but rather by checking the progress of decay, and absorbing the elements of putrescence, as those become developed.—*March 18th.*

METEOROLOGY; ITS CONNECTION WITH AGRICULTURE.

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

I propose in this paper to confine my observations to the effect of climate on the composition of the seed of wheat. I select one plant only for examination, because it will simplify the subject, and confine our attention more usefully to our object.

We are all aware that the wheat plant can only be cultivated in countries possessing a certain mean temperature, and even in these only at a certain elevation above the level of the sea. It cannot be successfully cultivated so far north as rye, nor on such high lands. In England, an elevation of 1,000 feet above the sea prevents the cultivation of wheat. In the south of France, in a warmer climate, it is found at 1,800 feet. But temperature is not the only influencing cause; the moisture of the climate materially affects the composition of the wheat produced. We all are aware that the quality of the wheat grown in Ireland, and in the northern portion of our own island, is not so "dry" as that of the south and east of England. The same remark applies to the varying quality of the wheat produced in wet and in dry seasons. The very record of our rain-gauges, and the analysis of rain water, would lead us to this conclusion. Let us note the amount of the rain which fell at the Royal Observatory at Greenwich in the last twenty years. The following is the record, a copy of which I owe to the obliging communication of Mr. Glashier:—

Years.	Inches.	Years.	Inches.
1832	17.7	1843	24.6
1833	23.0	1844	24.9
1834	19.6	1845	22.4
1835	24.9	1846	25.3
1836	27.1	1847	17.8
1837	21.0	1848	30.2
1838	23.8	1849	23.9
1839	29.6	1850	19.7
1840	18.3	1851	20.5
1841	33.3	1852	34.2
1842	22.6		

Now we may remark, that it is not only the varying amount of mere moisture which the wheat plant thus receives in various years, which influences the composition of its seeds, but that rain water moreover contains various chemical substances, which are the food of the wheat plant. The composition of rain-water has recently been examined by M. Barral (*Gard. Chron.* 1853, p. 52); and from these examinations we find, that if we take the annual average depth of rain falling near London to be about 24 inches, then this quantity (according to

M. Barral's examination of the rain-water of Paris) conveys to every acre of land the following substances:—

Nitrogen	45½ lbs.
Nitric acid	103
Ammonia	19½
Chlorine	12½
Lime	35
Magnesia	11

Total..... 227 lbs.

We see then that in the year 1852, for instance, the quantity of these substances falling on the soil of a farm in rain water, was nearly double (all other things being the same) the proportion of that which fell on the same spot of ground in the two previous years.

The advantage, then, of having the soil in such a state as readily and deeply to absorb the rain which falls upon it, is here well illustrated. It is here, too, that we may seek an explanation of the varying quality of the wheat of different years.

That the quality of the wheat grown in the drier counties of England is superior to that grown in the more humid districts is well known to every corn merchant. This remark is not confined to the wheat of England: the foreign corn which reaches our shores gives evidence of the same facts. Chemical investigations as to the composition of these different varieties of wheat, although not absolutely conclusive, bear upon this subject in a manner every way worthy of our attention. In the investigations of Sir H. Davy he found in 1,000 parts of seed wheat in its natural state (*Elem. Agri. Chem.* 150):—

	Mucilage or Starch.	Gluten.	Total.
From Middlesex	765	190	955
Thick-skinned Sicilian wheat	725	230	955
Thin-skinned Sicilian wheat	722	239	961
Wheat from Poland	750	200	950
North American wheat	750	225	975

It will be seen that in this case the amount of the starch, mucilage, and gluten of the seed wheat, the produce of the warm and dry climate of Sicily, far exceeded that of the English wheat; that of Poland was nearly as rich in these matters as the Sicilian, or that of the North American wheat, the richest of all.

Let us next examine the nature of the seed wheat, particularly the proportion of water it contains, as

grown in different English and foreign soils, and in different English districts; and although much of the results thus obtained must not be regarded as a perfectly conclusive data in leading us to certain conclusions, yet something useful may perhaps be gleaned from the examination of these numerous varieties, subjected to analysis by Professor Way and Mr. Ogston (*Jour. Roy. Agri. Soc.*, vii., 598).

The following tables, then, give the variety of wheat, the soil on which it was grown, the place, and the per-centage of water which each contained, on the retentive and on the dry soils.

## ENGLISH.

VARIETY.	SOIL.	PLACE.	Water per cent. in the Seed from the	
			Light.	Adhesive.
1 Hoptoun ..	Stone brash and clay.	Cireucester	..	12.0
3 Ditto ....	Stone brash calcareous.	Ditto	12.0	..
3 April .....	Ditto ditto	Ditto	11.0	..
4 White spring	Calc. clay	Ditto	..	11.0
5 Bristol red..	Brash and clay calc.	Ditto	..	11.5
6 Clover red..	Ditto ditto	Ditto	..	11.0
7 Red chaff Dantzie.	Ditto ditto	Ditto	..	12.5
8 Piper's thick-set.	Ditto ditto	Ditto	..	13.5
9 White chaff.	Ditto ditto	Ditto	..	11.5
10 Hoptoun ..	Ditto ditto	Ditto	..	11.0
11 Spalding ..	Stone brash calc.	Ditto	12.0	..
13 Creeping ..	Clay sand and grit.	Silpho, N. R. Yorkshire.	11.5	..
14 Talavera...	Ditto ditto	Ditto	13.0	..
15 White wheat	Ditto ditto	Ditto	13.5	..
16 Talavera...	Calc. loam	Ditto	12.0	..
17 Creeping ..	Ditto ditto	Ditto	12.5	..
18 Creeping ..	Hazel loam	Sir John Johnstone's.	13.0	..
19 Creeping ..	Heavy tough clay.	Harkness	..	13.0
20 Talavera...	Tough clay	Sunfield	..	13.0
21 .....	Free clay loam.	Horwood, N.R. Yorkshire.	13.5	..
22 Red Britannia.	Strong	Ditto	..	12.0
23 Red .....	Weak clay loam.	Ditto	11.5	..
24 White ....	Weak sandy clay.	Scalby, N. R. Yorkshire.	13.0	..
25 Creeping ..	Red clay	Harkness	12.0	..
26 Creeping ..	Clay and sand.	Ditto	11.5	..
27 Creeping ..	Ditto ditto	Ditto	11.0	..
29 Red straw ..	Loam	Waldron, Dorset.	11.25	..
30 Hoptoun ..	Ditto	Ditto	9.5	..
31 Hoptoun ..	Chalk	Ditto	11.5	..
38 Hoptoun ..	Siliceous sand	Whitfield, Gloucestersh.	11.5	..
39 Hoptoun ..	Stiff clay	Ditto	..	12.0
40 Hoptoun ..	Sandy	Ditto	12.0	..
41 Hoptoun ..	Clay	Ditto	..	12.0
42 Hoptoun ..	Siliceous	Ditto	12.5	..
43 Red straw ..	Siliceous sandy loam.	Ditto	12.0	..
44 Red straw white.	Ditto ditto	Ditto	12.5	..
45 Ditto ditto	Calcareous	Ditto	11.5	..
46 Ditto ditto	Clayey loam	Ditto	11.0	..

## FOREIGN.

VARIETY.	PLACE.	WATER.
		Per cent.
34 French .....	Frauce	11.0
35 Egyptian .....	Egypt	10.0
36 Odessa Polish .....	Poland	11.0
37 Marianople .....	Turkey	10.0
57 Rostock .....	Russia	11.5
58 Spanish wheat .....	Spain	13.0
59 Dantzie .....	Poland	11.0
60 Ditto .....	Ditto	10.0
61 Ditto .....	Ditto	12.0
62 Rostock .....	Russia	10.0

It is noticeable that the mean per-centage of water in these varieties of wheat was—

Nos.	Name.	Grown on	Water.
13 to 17	Yorkshire wheat	Light soils	12.5
18 to 24	Ditto ditto	Ditto	12.75
19, 20, 23	Ditto ditto	Heavy	12.68
25 to 27	Ditto ditto	Ditto	11.5
39 to 40	Whitfield ditto	Ditto	12.0
33 to 46	Ditto ditto	Light	11.88
1 to 10	Cirencester ditto	Ditto	11.55
2 to 11	Ditto ditto	Heavy	11.68
29, 30, 32	Waldron, Dorset	Light	10.75
34 to 62	Foreign wheat	.....	10.92

So that the proportions of water in this list of seed wheats is least in that district where the fall of rain is the smallest, viz., Dorsetshire; that it increases as we proceed northwards into Gloucestershire; and is most in the wheat grown in the North Riding of Yorkshire. In the list of foreign wheats, that from Egypt (where there is hardly any rain), and in that from Marianople (where there is but a small proportion, and where, in both places, the temperature is high), the per-centage of water is only 10—a much lower amount than that of the English wheats with the exception of that (No. 30) grown by Mr. Huxtable on the loam at Sutton Waldron, in Dorsetshire.

It is impossible, when we are examining these facts, not to feel how closely the meteorology of a neighbourhood influences even the composition of the corn which it produces. The English miller is well aware of these things; he mixes with the wheat produced in the damper districts of our island the dry corn produced in lands where the mean temperature is much higher, the rain-fall considerably less, and in consequence more free from moisture. Such facts, too, are of practical use to the agriculturist, for he well knows how by improved systems of cultivation the obstacles presented by even climate are overcome. He will remember districts where not only is wheat produced where a wheat crop was once entirely unknown, and that in the memory of the present generation, but that this state of things is one good result of improved drainage, and other great and scientific efforts of the English farmers.



ON THE APPLICATION OF NITROGEN TO THE SOIL.

Mr. Thomas Garnett, of Clitheroe, grows wheat year after year on the same land. In 1850, in 1851, and in 1852 he grew wheat, wheat, wheat. Nay, more, he produced on this same land 40 bushels of wheat per acre the first year, 50 bushels the second year, and a little over 60 bushels the third. If he goes on in this ratio, he will soon rival the Patriarch Isaac, who sowed and reaped in the same year "an hundredfold." Mr. Lawes tried growing wheat year after year until the land stopped at 15 bushels per acre, which was the natural produce of the soil, aided only by the manures of nature. The Lois Weedon system goes on with large productions and no manure. But Mr. Garnett adopts a more rational proceeding. Starting off with land, no doubt, of first-rate quality, capable of growing five quarters of wheat per acre, he manures it well with night-soil and coal-ashes—how much he puts on we do not know; nor does he, perhaps, for he is near a manufacturing town—but to this he adds only two cwt. of salt and two cwt. of nitrate of soda per acre! Doubtless his land is so rich as to be liable to be followed by mildew if guano is used, or nitrate, even, in the spring—so he has been dabbling with these, it seems, also—and therefore he applies them in the autumn, so that "the over luxuriance is dissipated long before the wheat is ready to shoot, and the result is highly beneficial."

Now, to those sceptics who are still so old-fashioned as to entertain the practical notion that *manure* is yet necessary to grow crops, and not to the more credulous believers in the Lois Weedon system of growing several crops per annum totally without manure, we would address a few observations on the two recognized modes of applying nitrogen to the soil—either as ammonia, or as a nitrate. In the first case, it is simply the gas in combination with hydrogen, and, in most of its forms, easily either dissolved or volatilized; in the other, it is not only combined with another gas—oxygen—and held in pretty close affinity as an acid, but also united with a base of some alkali, as a soda, or a potash, involving a much more complex mode of re-solution into the original elements, if, indeed, either solution, evaporation, or re-solution is necessary to fit either the one or the other for vegetable sustenance.

Every farmer knows that a nitrate will often wonderfully revive a dying wheat plant. It will frequently recover, and apparently restore, a crop for which the wireworm was charged as the destroyer. It will turn into the most luxuriant green the

brownest pasture. Some ask, what matter whether our grass grows green or brown, if we have no more of it? and in several instances we have applied it without one atom of success, especially to turnips.

Vastly different, however, are some trials. Those in Windsor Park, under the direction of His Royal Highness Prince Albert, showed a produce, on high undrained meadow land, of 29 cwt. 2 qrs. per acre, dressed with two cwt. of nitrate of soda per acre, against 8 cwt. undressed, and a balance in favour of the application of £3 11s. 8d. Then, again, on low-lying meadow, His Royal Highness had produced, by the same top dressing, 25 cwt. per acre, against 9 cwt. per acre undressed, and a balance in favour of the dressing of £2 13s. 4d. True, the dressings of the same quantities of guano were more favourable, as might easily have been anticipated; but we may well expect to hear of the whole park being dressed with the one or the other, so great is the profit of either application.

On corn, the results obtained are very surprising. Mr. Pusey gives the probable increase in produce of corn on land in good condition, by an application of nitrate of soda, at six bushels per acre, per cwt. of the nitrate; and on land out of condition, as much as eight bushels. He adduces several instances of this, and shows that on—

Barley, the Hon. H. Wilson obtained an increase of . . .	14 bushels.
Wheat, Mr. Calvert obtained an increase of . . . . .	12 bushels.
Oats, Mr. Newman obtained an increase of . . . . .	20 bushels per

acre by the application of 1 cwt. of nitrate of soda; while on Rye Mr. Fleming obtained an increase of 12 bushels per acre, by the application of 1½ cwt. of the same material.

As a reviver of a crop failing from one cause or another, Mr. Pusey quotes a most valuable case. He had a field of early barley cut off by the frost last spring. The field was ten acres, and to this the small quantity of 42lbs. per acre of nitrate of soda was applied, with 84lbs. of salt, which soon changed the colour to a beautiful green; but one plot was left undressed, for the sake of experiment. At harvest, the dressed barley was six inches taller than the undressed strip (about half an acre), and the result was, that the dressed produced 47 bushels per acre, the undressed only 40 bushels—an increase of 7 bushels of barley per acre, at a

cost of six shillings and fourpence! Furthermore, the sample was worth two shillings per quarter extra from the dressed than from the undressed land.

The essential and practical difference between ammoniacal dressings and applications of nitrates are the following:—Little variation seems to exist as to the absolute power of the plants to appropriate the one or the other. Ammonia, if applied as a top dressing, as it always must be to grass land and growing corn, will lose much by evaporation and volatilization in some of its forms most usually applied. Hence you must be almost morally certain of rain before its application. In a dry season, it seems nearly useless as a top-dressing, as when rain does come, it finds most of it escaped into the atmosphere. The nitrates may be applied in a dry season, because a dry atmo-

sphere rather preserves than wastes them; they neither volatilize nor evaporate to any appreciable extent; while a wet season may possibly wash them down too rapidly. Then, again, there is much risk of a top dressing, especially to wheat. It often, on highly farmed land at least, produces rank luxuriance and lodging, if not mildew. Practice seems to show that an addition of *salt* with the nitrate will have the effect of stiffening and brightening the straw, and so acting as a remedy for this defect.

Whatever may be the relative value of the nitrates and guano, we cannot but rejoice at the probability pointed out of the cheapening of the former, as it will doubtless tend to the reducing of the price of the latter, for it appears abundantly clear that the English farmers are paying one million per annum to the Peruvian monopolists.

#### LANDLORD AND TENANT.—IMPROVED METHODS OF CULTIVATION.—VALUE OF LABOUR.—ADJUSTMENT

It is fortunate for agriculture that its concerns are now taken out of the dominion of party politics. Improved methods of cultivation, which will enable landlords and tenants to meet low prices—if indeed there are to be low prices—by increasing produce or by diminishing the cost of cultivation, may now be freely discussed on their own merits. They may now be considered without endangering the return of one gentleman to Parliament, or excluding another from the Treasury benches.

The present more healthy state of feeling is evinced by the altered tone of speeches at agricultural meetings. Landlords, who had long been accustomed to inculcate on their tenants the doctrine that without a restoration of protective duties it would be impossible for them to pay *any* rent, are now reading them lessons on the importance of draining, marling, and irrigation, and are expatiating on the merits of guano and of superphosphate of lime. The market value of liquid manure and of agricultural chemistry has risen at least fifty per cent. among those who heretofore ridiculed “science and all that sort of thing.” All this is very gratifying to the friends of progress. It must be owned, however, that landlords appear to be now running almost from one extreme to another. Are they not proclaiming that such improvements will supersede the necessity for reducing rents in proportion to altered prices brought about by legislative changes? Landlords are now referring tenants to their own exertions as the means of extrication from their present difficulties; and they are exhorting them to make permanent improvements, which however are

#### METHODS OF CULTIVATION.—VALUE OF RENT.—LAND AGENTS.

the duty of the owner rather than the occupier of the soil. The agricultural waggon is bemired; and they are willing enough to perform the part of the waggoner in the fable, by whipping the horses; but they do not generally manifest sufficient inclination to put their own shoulder to the wheel, by reducing rents. The important truth, that the farmer is justly entitled to a reduction of rent proportioned to the altered value of agricultural produce caused by legislative changes, is kept too much out of sight; together with another truth, equally important—that if the tenant undertake improvements which ought to be made by the landlord, he is entitled to such a term in the land at such a price as shall return him the capital expended in effecting the improvement, together with remuneration for an outlay which will probably double the value of the land at the expiration of the term.

The remedy for excessive rents for the future is in the hands of the farmer himself. It consists in caution and circumspection in taking land, and a rigid adherence to a determination not to give for it one farthing more of money-rent than it is worth at present prices. If others bid more for it than it is worth, let them have it. But what, it may be asked, are farmers to do, if they give up their occupations and allow their land to be taken—in Irish phrase—over their heads, or, to speak more correctly, from under their feet? That is a question which we will endeavour to answer hereafter. At present we merely reiterate our advice to those about to take land, not to engage to give a higher rent for it than, on calculation, they find it to be

worth at present prices, and with such expenses of cultivation as they may now reasonably expect. Let them not be cajoled to look on Australian gold as a substitute for protection. Let them not be dazzled by visions of a revolution in prices, arising from a depreciation in the value of gold to such an extent that land now worth twenty shillings an acre is to become of twice or thrice that value during the next fourteen or twenty years. No great alteration in prices, as we have endeavoured in former articles to prove, is likely to arise from this cause. Should it arise, it will be very gradual in its effects, and will not alter the relative position of any class, unless bound by fixed money engagements, because it will raise the price of all which they buy, just as much as it will raise the price of all which they sell.

An increased value of labour, however, must enter into the calculations of every one about to take land. The extent to which free trade will reduce the price of agricultural produce, on the average of years, is a question of which we have not yet obtained a complete solution. Perhaps it may not turn out to be so great as many suppose. That free trade has not reduced the wages of labour is certain. When the depreciation in the value of agricultural produce was the greatest, the money wages of agricultural labour had not fallen more than ten per cent., while the price of bread, which forms the chief portion of the labourers' food, was reduced twenty per cent. This advance of wages, for such it virtually was, was not the result of emigration. The English exodus had not then commenced. That from Ireland was in progress; but so far from having relieved the pressure of population on the labour market, it had aggravated it by causing a large influx of Irish labourers of the poorest class, who were destitute of the means of crossing the Atlantic. The absence of the periodical swarms of Irish reapers had scarcely begun to produce any effect on agricultural wages till the harvest of 1851. It was only in 1852 that emigration to the Australian gold fields commenced from England. Scarcely a year ago, agricultural labourers, starving or maintained by the poor-rates, constituted one of the nightmares which haunted the dreams of some of us. Now the tables are turned, and we hear from all quarters of a scarcity of labourers. Even Wiltshire witnesses the marvellous phenomenon of a strike among that class for an advance of wages from seven shillings a week to nine shillings. Till the Australian diggings shall be exhausted—and, considering their vast area, they are not likely to be exhausted during the currency of an agricultural lease, or until wages in this country and in Australia shall so nearly approach a level that the difference will leave little inducement to

sever the ties of home and kindred, in order to obtain it on the opposite side of the globe—the stream of emigration will continue to flow with increased volume and accelerated velocity. Labour is now about to have its day. The farmer about to take land must therefore calculate not only the difference between the present and the Act of Parliament prices of produce, but must frame his estimate on an increased and an increasing value of labour. This increase will not be confined to mere farm labour: it will extend to the wages of the smith, the wheelwright, the harness-maker, and all artificers and labourers employed by the farmer and by the tradesmen with whom the farmer deals. All this will increase the cost of production. Rent is, or ought to be, the surplus produce, after defraying the cost of cultivation, together with a moderate remuneration to the tenant for his skill, capital, and industry. Rents, therefore, must be affected in proportion to the advance in wages, as well as in proportion to the reduced price of produce. If land of a given quality be worth a rent of 20s. an acre, with the price of wheat ranging between 40s. and 50s. per quarter, and other agricultural produce at proportionate prices, wages being 10s. a week, what rent will it be worth, agricultural produce remaining at these prices and labour advancing to 20s. a week? These are both probable contingencies, and this is the calculation which all who are about to take land must now carefully consider.

On estimating the difference in rent for land of similar quality, which has been rendered necessary by free-trade prices, and by the advance of wages which free trade and emigration have produced and are producing, the landlord will be ready to claim some set-off for improvements in cultivation, and for diminished poor's-rates. When we talk of poor's-rates, however, it must not be supposed that they, any more than rent, form part of the cost of production; they are a rent-charge on the land, borne ultimately by the landlord, just as much as the landlord's property-tax, which the tenant advances, handing in the receipt as money on the rent day.

There is no mistake more prevalent among farmers than the belief that tithes and poor-rates are parts of the expense of cultivation. They are both parts of the rent: the farmer has three landlords—the church, the poor, and the landowner—who stand, as to priority of claim, in the order in which we have placed them. The rent-charges of the church and the poor must be satisfied before all other claims, except those of the crown for quit-rents. Till they have been paid, the owner of the soil cannot touch one farthing of the surplus produce, which remains after defraying the cost of cultivation, and remunerating the tenant

for his skill, capital, and industry. Abolish tithes and poor's-rates, and the land would let for so much more rent. If any farmer doubt this, let him look around him at the land which is tithe-free and extra-parochial, and see if it does not let for the amount paid for rent, tithe, and poor-rates, on land of similar quality in the same neighbourhood, which is subject to the two latter charges. The only way in which the tenant is affected by the poor-rates, is when from unforeseen circumstances they exceed, or fall short of the average on which they were calculated when he hired his land.

Before offering any rent, he ascertains their average amount, or if he omit to do so, neglects it to his own wrong. If from peculiar circumstances, they fall below the average, they become, to the extent of the diminution, a deduction from the cost of cultivation; and until his rent shall be raised in proportion, they add to his profits.

Some further set-off will be also claimed by the landlord, arising from improved methods of cultivation, the value of which has been fully established within the last ten or fifteen years. In making this allowance, no improvements are to be taken into account which are not already established in practice, or that have been proved to be suited to the locality. The tenant is not to be expected at present to distribute liquid manure by the steam engine and underground pipes, with Mr. Kennedy, Mr. Mechi, and some five or six other such experimentalists; no more than he is called upon to grow wheat on the plan of Mr. Smith of Weedon.

There are, however, two classes of farmers, and if the tenant belong to that class who think that draining injures their land—if he will not wage war with docks, couch, and thistles, because his land breeds them—if he prefers the manure of cattle half-starved on straw to that of beasts fattened on turnips and purchased food—if he suffers the rain to wash the best part of his manure into the nearest stream—if he will persist in ploughing his land with more than two horses, when two horses are sufficient—if he will use waggons instead of one-horse carts, and spend his money on a pampered show team fatter than his oxen, and decked out in gay harness and jingling bells—if he prefers thrashing by the flail to thrashing by steam—if he prides himself on adhering to the good old-fashioned implements, and rejecting all mechanical contrivances for the abridgment of labour—if he thinks it better to sow turnips broad-cast than to drill them—to sow three bushels of wheat where one and a-half or two would not only suffice, but yield a larger return—if he thinks it better to let his sheep tread their turnips into the mire than to give them

cut, and in troughs—if he thinks it better to let his horses waste half their hay under their feet, by pulling it out of racks, instead of cutting it into manger food—of course he has a right to do as he likes with his own; but he cannot expect his landlord to pay for these vagaries, because farmer Slowman chooses to indulge in them, and to stand still while the rest of the world is in motion. The landlord cannot be expected to consider them part of the necessary expenses of cultivation, any more than the hounds and hunters of farmer Harkforward, whose extravagance is the constant theme of the other's denunciation. It is no excuse for the latter that he keeps to the good old ways of his father and grandfather. Our grandfathers did many things which their grandsons have wisely eschewed. But if a grandson has occasion to go from the south of England to York, and he chooses to walk, or to travel on horseback, or to make the journey in a stage-coach or a broad-wheeled waggon—that is to say, if he can find a specimen of either of those venerable locomotives still in existence, his grandfather did so before him, and, of course, in this land of liberty there is nothing to prevent him from doing the same; but he must not be surprised if those who travel by steamboat or by railway reach the end of the journey in shorter time and at less expense. Neither must the farmer, who will persist in obsolete practices, be surprised if he is outbid for land by some experienced farmer from a better-farmed and more highly-cultivated district—or by some pupil from an Agricultural Society, who has added to the science gained there the practical knowledge obtained by five years spent under a farmer in such a district. He must not be astonished if he is outbid by some sub-contractor who has made money on a railway—some lucky navvie returned from the diggings—some wealthy country shop-keeper, of agricultural origin, who knows *something* about farming, though not *quite so much*, perhaps, as the character we have sketched—some innkeeper or coach-master, who in these railroad days finds coaching no longer profitable—some guard, or coachman, or commercial traveller, who, in their journeys through different agricultural districts, have observed the demarcation in the practice of each, and the relative success of its results. Among all these competitors, the experienced farmer and the agricultural pupil must have decidedly the advantage; and with respect to the rest, so long as the old methods of cultivation were the best agricultural practices known, the grandson's "practice," and his "having been bred on the land," might give him some advantage; but as regards the new practices, he has almost as much to learn as the least agricultural of those who will be bidding against

him for land which he wishes to take or to retake. Some of them will come to their new occupation with the knowledge of being better calculators and accountants, and having a greater command of capital.

He, therefore, who is about to make a fresh agreement for land, must calculate, on the one hand, on prices somewhat lower than those which he has been taught to consider the only remunerative scale, and that accompanied by a higher rate of labour. On the other hand, the landlord will be sure to claim a set-off for diminished poor-rates, and for the increased value which well-established improvements in cultivation have given to land. The difference between these opposing elements may be difficult to determine, and the calculation may be intricate; but it must be made by every prudent man, be he landlord or tenant. The farmer who is determined not to attend to the improvements which we have enumerated may as well retire from farming altogether; for they are rapidly spreading, and those who adopt them will infallibly undersell those who reject them, or will be able to pay a higher rent for land of the same quality. Not only is British agriculture exposed to unrestricted competition with foreigners; the stand-still British agriculture has to contend with the go-ahead British agriculture. In the same market, and at the same time, there cannot be two prices for the same commodities of equal quality, and the price of every commodity will ultimately be regulated by the cost of producing it.

We must be understood with some limitation when we said in a former article, that the farmer, who has made up his mind not to adopt the modern improvements which we enumerated, all being sanctioned by the experience of many years, and now rapidly spreading among practical men, would do well to abandon farming altogether. We should have said that he would do well to "decline the farming business," as the advertisements have it, *unless* he can meet with a landowner of a congenial spirit with his own, or a landowner whose property is managed by an agent of the same stamp, which we fear in many cases will not be difficult. The Slowmans belong to a family as numerous as it is ancient; they are by no means confined to the tenant class—many of them are extensive landowners; and among managers of landed property, those of another name must, not unfrequently, be regarded as constituting exceptions to a general rule.

These gentlemen detest innovations, whether in science, politics, or agriculture. They abhor railways and steam as much as they hate and despise spinning jennies. They delight in six-acre fields surrounded by fences a perch wide, and well

stocked with trees. They like them not only because they look on the preservation of game as among the first duties of a country gentleman, and because they find it advantageous to feed game and grow timber at the tenant's expense, but because they consider hedgerows ornamental and characteristic of English scenery. When in a very patriotic mood, moreover, they regard them as one of our best national defences, constituting so many entrenchments against an invading army. They delight, also, in straggling farmsteads, which have grown up during centuries by the addition of a barn here, and a cart-lodge or cattle-shed there, erected without any discoverable plan, unless that of throwing every possible impediment in the way of the proper management of the manure, and the economical performance of the work of the farm yard. They prefer these straggling ill-arranged buildings, situated as far as possible from the centre of the farm, to the modern, compact, well-placed farmstead, with its one small barn, its tall chimney, and its steam-thrashing machine, all so arranged as to secure the utmost economy of labour in the feeding of cattle and the conversion of crops. They prefer the inferior buildings, not merely because the erection of better would involve the necessity of an inconvenient outlay of money, but because they are more picturesque, and because there are classical and poetical associations connected with the "rustic sound of the flail" which will never attach to the thrashing machine. These are tastes which gentlemen have certainly a right to gratify, like a taste for Elizabethan architecture, or carved oak furniture, or any other usage of the middle ages now so much in vogue—even to the strewing, if they will, of their ancestral halls with rushes instead of carpets. All riders of hobbies, however, must pay for riding them; and gentlemen who luxuriate in mediæval homesteads, and mediæval methods of cultivation, must pay for their hobby by letting their land to such tenants at mediæval rents. In defence of these landlords, however, we must in fairness admit that too many of our modern improvers appear to regard ugliness as an essential ingredient of utility, and to aim at making their improvements as repulsive as possible to the eye of taste. We have seen estates cleared of timber to the extent of deformity, when a more moderate clearance judiciously conducted, would have improved the beauty of the landscape, quite as much as it improved the value of the land, and would have left it not so very bare of shelter. We knew these clearers to be honest enthusiasts, guilty of no error but that of being destitute of taste.

We have seen farm-houses and farm-buildings erected on the most improved principles replete

with every convenience, in which the manufacture of manure and of beef could be carried on with all the systematic economy possible; the exterior of these buildings, however, was so tasteless as to render them a complete eyesore from the windows of the mansion. No wonder then if many landowners, who came to inspect the model with a view to the improvement of their own property, turned away from it in disgust, and were happy to avail themselves of any excuse for not disfiguring their estates with anything so hideous. And yet, if the minds which planned these buildings had not partaken quite so much of the utilitarian cast, but had studied the graces a little more, they might have been made, with scarcely any additional expense, as ornamental as they were useful; and might even have had a touch of the mediæval impressed on them, without which nothing will go down at the present time.

If Mr. Barry or Sir Joseph Paxton would take one of the most approved of these modern homesteads in hand, and, by a slight alteration of the elevation, could give it a dash of the antique and picturesque, we know of few things which would more advance the cause of progress as regards agricultural buildings—always excepting the discovery of means by which landowners might be provided at an easy rate with funds for their erection.

From tenants and landlords of this description let us now pass to the like among land-agents. Land-agents have a more powerful and extensive influence for good or for evil than either landlords or tenants, since landlords rarely trouble themselves with the management of their own property. A good agent acts as a corrective to the defects of both; a bad one aggravates them. There is no employment which requires a higher range of qualifications, and a greater amount of varied and extensive knowledge, practical and scientific; and yet there are few in which they are more disregarded. There are doubtless many, very many excellent managers of landed property, who by their example exercise a salutary influence on neighbouring estates, as well as on those under their immediate care. But taken as a class, many are unqualified for the duties which they have to perform. The majority are auctioneers and lawyers. The remainder are a motley group classed under the general name of practical men; because, having had practice in one calling, they are supposed to have an intuitive practical knowledge of any other, and because being destitute of any scientific qualifications they denounce science.

Among them we generally find pet-tenants, coachmen, grooms, butlers, and game-keepers, advanced to the post chiefly in consequence of the facilities which they enjoyed for gaining the ear of their employers, and their adroitness in availing themselves of the advantage.

There is no reason why country auctioneers and attorneys should not know something of farming, nor why they should not know more of agriculture than the mere local practice of their own immediate neighbourhood. There is, moreover, no cause why, possessing such knowledge, they should not make as good managers of landed property as most of those entrusted with that office, provided the sales of the one, and the writs and latitats of the other, do not occupy too much of their time and thoughts. But this is a knowledge they rarely possess. They consider their duties confined to the receiving of rents, giving receipts to those tenants who pay, and distraining on those who do not; rendering accounts properly vouched, and handing over the money to their employer without misappropriation. These are important parts of the duty of a land-agent; but they are not the whole. Questions of repairs, drainage, deviation from the antiquated rotations prescribed by musty leases, will be perpetually arising. The advice of some favourite among the tenants is then called in, and paid for by being allowed to hold land at a lower rent than his fellows. This man, the creature of local custom, cannot be expected to approve of any system of cultivation better than his own. Agents, therefore, who themselves know but little of agriculture, naturally dislike improvement, because it involves questions which they do not understand. The lawyer is, moreover, the follower of precedent. His covenants for the farming of 1853 have been transmitted from lease to lease since 1553, and are generally guarded by the saving clause, that the cultivation shall be according to the custom of the country. Under such management the Slowman tenants flourish most, and to such estates they should resort. Intricacies in the laws affecting real property, and the fatal connexion which subsists between the land and electioneering, have thrown the management of estates too much into the hands of the legal profession. It will be well indeed for landlords and tenants when these gentlemen shall be confined to their proper sphere, that of legal adviser, and when the duties of land-agent shall be executed by persons qualified for it by special education.

IMPROVEMENT OF THE SOIL.—CLAY VERSUS MOOR LAND.

The wide-spreading disposition which now exists to lay out capital in the improvement of the soil is worth a little investigation. Whether it is more profitable to improve nearly worn-out clay land, or is it a more promising speculation to the capitalist to take uncultivated moorland, and commence *de novo*? Taking the worst class of low-lying, thin-soiled, tenacious, waxy clay, and setting it against moorland containing a considerable proportion of sand with the clay, and in a *climate* and *elevation* not unsuited to the cereals, the question is readily answered. The sandy moor will buy the fee simple before the clay will pay a rental.

We will here give an outline of the comparative cost. Assuming the outfall to be in each case similar—though this will seldom happen, for moorland is generally higher lying than the surrounding district, whereas clay is usually more or less in a basin—but, admitting them to be the same, we may thus state the outlay. Draining the clay land, at the present cost of labour, can never be set down at less than five pounds per acre. The tenacious clays we indicate, require frequent drains, and they must also be of considerable depth. At the depth of from three to four feet there are usually natural concretes of stones and gravel, set as tenaciously as they were left by the flood which deposited them. To get work like this executed at four feet deep will cost from 10d. to 12d. per rod, and the outlay cannot be less than five pounds per acre throughout the farm. Then assume the landowner has to put the soil in the condition fit for the tenant entering favourably, and if not, if the tenant has to find his own capital to complete the improvements, it will be at a sacrifice of rental more than proportionate. Furthermore assume that the following by the landlord follows, and no less than twenty-five to thirty shillings per acre will be the cost of this process. Then it will require an application of some kind of extraneous manure. Guano will produce the most immediate effect; but, as ultimate improvement is the object, and as fresh unoxidized clay is brought up from the drains, lime will be necessary, to get it into a state of permanent fertility and pulverization. Three tons per acre, at the least, will be necessary, and this, at an average cost of nine shillings per ton, with an additional 2s. 6d. per ton for carting, will make an average of 34s. 6d. per acre before the land is fit to sow down to crop.

The expenses, then, are as follow:—

	£	s.	d.	
Draining . . . . .	5	0	0	per acre.
Ploughing &c. . . . .	1	10	0	”
Liming and application . . . . .	1	14	6	”
<hr/>				
Making a cost per acre of . . . . .	£8	4	6	”

Take moorland covered with heather and gorse in varying proportions. Sandy surface, with clay below, usually four to five feet of sand, and a small superstratum of vegetable matter, but quite inert. The drainage of this land is a matter widely different from that of clay; if free from stones, a great advantage will be gained; if stony, these will have to be taken out. The draining of sands of five feet deep, when the water runs between the sand and the clay, as is universally the case, is a matter by no means formidable, and three pounds per acre will in general be a sum very near the mark it will cost. Then comes the paring and burning; amongst heath roots, not a very easy or cheap process; set it down at 35s. per acre. Spreading the clay which comes out of the drains, 3s. per acre. Ploughing up, 7s. per acre. Guano, three hundred weight, at 9s. 6d., and four bushels of dissolved bones, at 4s. per bushel, and you have the active ashes—the stimulating manure—with the mixed soil; and a crop of turnips will be the result. In the next autumn a claying may be given, if that taken out of the drains is not sufficient, say 100 loads in addition, at one ton per load, and 6d. per ton for carting and spreading. The cost of the reclamation of the moor will, therefore, be as under:—

	£	s.	d.	
Draining . . . . .	3	0	0	per acre.
Paring and burning . . . . .	1	15	0	”
Spreading clay . . . . .	0	3	0	”
Ploughing . . . . .	0	7	0	”
Guano . . . . .	1	8	6	”
Dissolved bones . . . . .	0	16	0	”
<hr/>				
Total . . . . .	£7	9	6	”

But if the claying be added, it will be £9 19s. 6d. per acre.

And what may then be the probable return in four years? Assume the clay to produce 25 bushels of wheat, to carry four sheep per acre as seeds, and to grow 4½ quarters of oats per acre, the sandy moor will grow six quarters of oats, will carry as many sheep in seeds, and will produce 30 bushels of maslin per acre, or of wheat, if oilcake has been eaten with the turnips, in which case

their value is not reckoned—the  $\frac{1}{2}$  lb. of cake per sheep per day assumed to be given to them when high cultivation is the aim. The balance would stand thus:—

<i>Clay.</i>	£	s.	d.
Twenty-five bushels of wheat, at 6s. . .	7	10	0
Four sheep, twenty weeks, at 4d. . . . .	1	6	6
Four and half quarters oats, at 20s. . .	4	10	0
	13	6	6
Cost of improvements . . . . .	8	4	6
Left for rent in four years . . . . .	£5	2	0

<i>Moorland.</i>	£	s.	d.
Six quarters of oats, at 20s. . . . .	6	0	0
Four sheep, twenty weeks, at 4d. . . . .	1	6	6
Thirty bushels of wheat, at 6s. . . . .	9	0	0
	16	6	6
Cost of improvements . . . . .	9	19	6
Left for rent in four years . . . . .	£6	7	0

Showing a result in favour of the moor of £1 5s. per acre in four years, or a difference of rent of 6s. 3d. per acre in favour of the moor. If stones had to be taken out it would reduce this, but the principle will nevertheless approximate very closely.

### COUCH OR TWITCH GRASS.

Mr. Miles, M.P., of Leigh Court, Bristol, never bestowed a greater benefit upon agriculture than by turning the attention of scientific men to that pest of the light land farmer, the couch or twitch grass (*Triticum repens*). It is truly remarkable that we know so little of so dire an enemy to sand-land cultivation; what we are acquainted with seems to be confined almost to the following particulars:

1. It is most prevalent on very light porous, grey, yellow, and red sand; on clay, peat, chalk, and on loam of almost every kind, it is entirely unknown, when there is anything like attentive cultivation.

2. It seems to be most injurious when the atmosphere contains a considerable quantity of moisture, either in suspension or in the shape of rain. In very dry situations we have seen soils remarkably free from it; and though this does not hold good as an invariable rule, still it is a truth that even the red sands of Westmoreland seem more subject to it by far, than the same class of soils in other districts, owing we believe to the prevalence of atmospheric moisture.

3. It is common on the red sandstone formations, and much more so on the hill tops than either on the hill sides or in the valleys; the former being usually too firm for the couch to maintain its dominion, and the latter being absolutely clay or peat, which in most cases seem to have the power of resisting its influence.

4. In a four-course system of husbandry, with almost any amount of cleaning, light blowing sands will be full of it. We have often heard parties insist on farmers cultivating blowing sand on the four-course system, and then censuring them for growing couch; whereas the two things were precisely cause and effect. The four-course system on light sand, where breeding stock is kept, is by no means either a self-sustaining or a clearing system.

5. Twitch cannot, on such soils, be kept down when frequent crops of corn are grown. This is

true from the oldest cultivated field to the one most recently taken out of grass; but it may not be generally known that fresh fields, recently ploughed up, are not subject to twitch until there has been a succession of corn crops grown on the land.

6. The five-course system is no remedy, but rather the reverse, on light soils, where the last crop in the rotation is corn, the foulest stubbles following after a two years' ley. The light-land farmer of North Nottinghamshire complains that if he persists in a system so successful in the southern portions of the same county, he will have a mass of couch grass to contend with.

7. The land may be as clean as possible in the turnips, barley, and seed crops, aye, and appear so when sown with wheat, and yet at harvest time be full of couch. Indeed, the foulest crops are often those in which the greatest pains of picking have been bestowed, caused possibly by the farmer's conviction that all he could do to reduce this weed would be needed in cases of this kind.

8. Couch grass and fingers-and-toes in turnips often accompany each other: the latter by taking off the turnips has a tendency to encourage the growth of all kinds of weeds to which the land is subject, and therefore that of couch in particular.

And though the couch is a plant most impoverishing to the land; though it never accompanies a yielding crop, in fact it prevents it from becoming so; though it may be supposed from its alliances to be fed on the same materials and possibly in very much the same quantity as wheat, there is not extant, that we are aware of, any analysis of its constituents whatever. The table is left blank in Hemming's essay, and Mr. Miles has most properly called the attention of Professor Way to the circumstance, and we are glad to find that the subject will be thoroughly investigated.

That it does abstract vast quantities of real food for the crops, from the soil we can well believe; for



we do not know a better manure for turnips than decomposed couch if saturated with a little tank liquor, and we have seen very fair turnips grown with decomposed couch alone. In the state first mentioned we have tried it with success against town-dung, and have no doubt, if it were collected and carefully put by, it would be a valuable auxiliary to the waste manures of the farm; but it would be the second year before it would be safe to apply a plant whose vital powers are so extensive and tenacious.

There are three or four conditions in which it does not appear to thrive, and these we cannot help noticing anterior to the investigation. It appears, nevertheless, to possess strong assimilative powers; for on soils too poor for wheat or oats it will be the most luxuriant; and when both co-exist in a soil decidedly unequal to the production of both, the couch will eat out the corn.

These powers seem to come into operation soon after harvest in a still more vigorous degree; for it seeds at harvest, and, unlike the wheat plant, continues to live under ground, spreading ten thousand filaments in every direction. Now though it

prefers a porous soil, still it must have root-hold, and if disturbed in Autumn immediately after harvest, it never makes much head-way. To scarify therefore below the roots after harvest, even if nothing more is done, stops their progress, destroys many during the winter frosts and materially assists the cleaning in the spring. Hoeing in summer or even horsehoeing seems to be of no use whatever, but is generally the reverse: it divides and transplants the roots in a thousand pieces. Perhaps the only way to eradicate couch is to grow fewer crops of corn. If the seeds, instead of being sown with wheat or oats, be broken up, and grown as bastard fallow in the second year of their growth after Midsummer—a time when they are of little real use as food for the stock—the enemy may not only be arrested, but almost extirpated, and the soil will be free from those crops which foster the shedding of the seed of the couch; a state of things indispensable to the eradication of the weed from the soil.

We hope the hints thrown out on the natural history of this well known but little investigated enemy of the farmer may assist the professor's analytical researches.

#### DISEASE IN SHEEP.

The great losses of the lambing ewes, which we hear of from all sides, are, at a period when wool is scarce and mutton dear, objects of anxious solicitude. That there would be much rot amongst them, to be visible only at the time when the system became taxed by the parturient and lactiferous symptoms, was what we were all along led to expect. That there would be death amongst the flocks to a very serious extent we have stated in previous articles; but that, independently of these two causes, there should be great fatality amongst lambing ewes—a large per-centage of those which have lambed up to the present time having died either after or in that process—was what we had no correct means of calculating upon. The subject was last week brought before the Royal Agricultural Society by Mr. Fisher Hobbs; and the opinion given by Professor Simonds was, that the unfavourable weather in the autumn and winter had impoverished the supply of blood, leaving the system in a state too feeble to rally under the combined influences of weakness and exertion and low fever: that inflammatory action or simple weakness was the cause of such sad disasters in sheep-feeding as we are unhappily subjected to during the present season.

The first symptom of the disease is heaviness or stupor. The ears begin to droop; the animal refuses its food, and becomes rather listless than

apparently ill. Sometimes nasal running commences; sometimes it is absent, but diarrhoea sets in. This disappears; a slightly feverish symptom follows; the ears get cold, the bowels very sluggish, the animal staggers—not the acute giddiness of the sturdy, but an apathetic trembling, propping feebleness, and ultimately inflammation either of the lungs, brain, or bowels sets in weakness and death. This is one class of symptoms. Another is, that the ewe will lamb; she will seem as if she were getting over the season pretty well, only she will be weak; in twelve to twenty-four hours she will be feeble and tottering; her milk will flow badly; and she will begin to neglect her lamb—a symptom, as the shepherd knows, generally terminating fatally.

The cause of the disease is doubtless, as the Professor says, "atmospheric influence acting on the general functions of the body, producing unhealthy secretions, and resulting in a vitiated state of the whole mass of the blood in the system, and functional derangement of the brain; there being also a deficiency of blood, while the ewes require at the time of parturition not only a healthy circulating mass of such fluid, but a larger amount of it."

To cure is a precarious case. Prevention is now late to adopt. The evaporation from a constantly wet skin; the exposure to the cold east and

north blasts, with this predisposed system; the wet dirty state of all the food; the constant damp and cold state of the ground; all tend to render the sheep less capable of withstanding the severity of a storm which afterwards sets in, diminishing the ready supply of that all important—turnips. And the scanty crop of these also has been too much a cause of great stinting and diminution of the supply.

The resources of the farmers now are but extremely small. The increasing wants of the lamb will more than counterbalance the extra food we can give, while we must aim at saving life—in giving very nourishing food, we must be careful of over stimulating the enfeebled stomach and bowels. Turnip-tops and cabbages should be avoided; nor should the ewes be put in too grassy pastures. We would recommend a daily allowance of a gill of split peas and as much crushed or even whole oats, with chopped hay when the grass is deficient, or cut Swede roots with the tops removed. Let them have constant access to salt; not mixed in the food, but allowing them to use it at their pleasure as their wants may require. House as many of them at night as possible; and where no fit houses are at hand, make temporary sheds of hurdles and long straw, and cover with the latter material, without untying the battins.

We recollect a very small Leicester ewe we had, which had three lambs at one year old, and three lambs each year for three years afterwards; and she always had an attack of this

feeble state as a result of parturition, and, though the best of mothers, would stand carelessly by grating her teeth, and half-neglecting her lambs. We immediately commenced a system of cordials. The following was our first prescription:—Two ounces of onions boiled in a pint of water for fifteen minutes, strain, and given. This kept the bowels healthy, and gently stimulated the stomach. Every two hours we gave one pint of water in which an ounce of flour had been boiled, and so made into gruel with two glasses of good-bodied port wine. When she seemed in pain, we added a dose of laudanum. We have given a quarter-of-an-ounce in such cases with advantage, and the ewes which require the dose will hold their mouths for it like young birds for their food.

When constipation has set in, the onion gruel and ginger will be useful. When the diarrhœa is at work, the flour-gruel and port wine mixture may be tried; but all may possibly fail, and a change to regular and liberal food, with fair shelter, will be of more use in prevention than a thousand remedies.

Where there are no turnips, a little linseed may be crushed with the peas, and given with chaff to advantage. It is by no means a bad plan to have a net hung up, with fine sweet hay, for the ewes to amuse themselves *ad libitum*. The cattle will readily eat all they may leave, and fresh hay should be given every morning. A liberal and judicious diet is the best chance of the shepherd saving the life of his flock.

## AGRICULTURAL STATISTICS AND INDUSTRIAL EDUCATION.

It is stated, with authority, that two subjects of considerable importance to the agricultural interest now engage the attention of her Majesty's ministers—agricultural statistics, and industrial education. On each of these we have a few remarks to offer, commencing with industrial education.

Besides the rumoured appointment of a Minister of Education—the office to be filled by Lord John Russell—there is the more certain announcement that a Department of Practical Science is to be established, in connection with the Board of Trade, similar to the Department of Practical Art, and that Dr. Playfair is to be secretary to the one, as Mr. Henry Cole is to the other. It is further announced that Dr. Playfair is to be inspector of the local establishments for scientific education, which are springing up in the manufacturing districts, and a better appointment could scarcely be made. Simultaneously with this movement, a change is announced in the constitution of that institution

in Jermyn-street which rejoices at present in the triple title of School of Mines, Museum of Practical Geology, and Office of the Geological Survey. The control of that establishment is to be transferred from the Board of Works to the Board of Trade, and it is to receive the more comprehensive, but more compact, title of the College of Practical Science. What it may have done to promote the art of mining we know not; but for that of agriculture it has done nothing, because it has attempted nothing. We presume, however, that, when re-organized, one of its objects will be to promote the education of the agricultural class in those sciences which have the greatest connection with their industrial pursuits. This can only be accomplished by means of local institutions. Farmers cannot be expected to send their sons to study in Jermyn-street, St. James's. That locality is admirably suited to officers in the army and navy, to the younger branches of the aristocracy, and to

country gentlemen about town. All these may there obtain much useful knowledge during hours which might be worse employed than in its library, its laboratory, and at its lectures. Farmers, however, must have local schools of science or none. Let us consider, then, what the requirements of agriculture are, in regard to scientific education, and how they may be supplied by means of local institutions.

In the first place, as to what agriculture does not want in the way of education. It does not want the Latin and Greek of the old grammar schools with which most counties abound, and which have, in many instances, fallen into disuse, partly from misappropriation of their funds, partly from perseverance in a course of education unsuited to the wants and habits of the age. Neither does it want schools with farms attached to teach the practice of farming. The continental nations have taken the lead of us in industrial education. We may, therefore, benefit by their example, and take warning from their errors. One of these has been found to consist in attempting to teach the practice of any art at school or college. It is only to be learned from actual business in the office, the manufactory, the mine, or the farm. The education of the young farmer should consist, like that of the civil engineer, of two portions—the one scientific, the other practical. The scientific should precede the practical portion. At school he should be thoroughly grounded in those sciences which are applicable to his profession. Having completed that part of his education, he should then spend five or six years as pupil with a practical farmer, just as the engineer, on leaving school, spends a like term of pupilage in the office of some eminent civil engineer. On the farm, he will be taught the practice of agriculture as it at present exists, and will learn how to apply his science. His science will enable him to trace the reasons of operations which are now performed from mere routine, without regard to varying conditions. It will teach him to discover what is sound in existing practices, and should be retained—what is defective, and should be corrected. Where it requires improvement, his science will guide him in devising the best mode of improving it. The sum of all knowledge is that we know nothing; and the more science he possesses the less liable will he be to jump at conclusions. The farm on which he learns his practice may be that of his father, or of a stranger, in one of our most advanced districts. If we suppose his scientific education completed at the age of nineteen or twenty, his pupilage to practice will have expired quite as soon as it will be desirable for him to set up in business for himself. In many instances, it will be sooner than his

father, who may have a large family will be able to take a farm for him. The interval may be employed advantageously in acting as paid assistant to an eminent farmer in another county, and thus seeing something of the practice of more than one district, or as bailiff to some landowner. From that post he will, in all probability, rise to that of steward; and, having entered on that occupation, will have little inclination to quit it to become a tenant farmer.

There will thus be raised up for landowners a superior grade of land-agents to those into whose hands the management of landed property generally falls. That profession will be transferred from the class of lawyers to that of the tenant farmers. Our friend the Farmer will have one son provided for, without being obliged to borrow money to stock a farm for him. Nor is this all. The scientific education which these provincial schools should afford will qualify the pupil for other pursuits than those of agriculture, and will establish more intimate relations between the farming, the manufacturing, and the scientific classes. Some sons of farmers will carry their science to the manufacturing, others to the scientific market, which will be both extended and improved. The latter will become professors in the new schools and colleges, and teach science in their own counties to a new generation of farmers; will not that be a proud day at market and fair for the father of the learned professor! Then will many a farm-house be pointed out hereafter as the birth-place of new Herschels, Faradays, and Davys. Then will the silly warfare between practice and science cease. Then will "practice with science" become something more than a mere name in agriculture. At present they too frequently resemble two wild pointers, coupled together, but pulling in opposite directions.

#### ST. GERMAN'S FARMERS' CLUB.

In the present age an extensive cultivation of green crops seems to be indispensable, and in order to carry this out successfully, good artificial manures appear to be equally so. That great adulterations in manure have taken place is a fact too well known to be denied; that such adulterations cause considerable loss to the farmer and the community at large is a truth equally clear, consequent on the deficient production of the crop. It therefore behoves the cultivators of the soil, when so many manures are introduced, to be careful and persevering in their efforts to procure a genuine article, and to give the utmost encouragement to those manufacturers who produce the best manure.

The members of this club having heard of an advertisement in the *Mark Lane Express*, inserted by a company at Newcastle upon-Tyne, who professed to make a manure denominated "Ammoniacal Guano," which they would test against

any other manure in the kingdom for £100, and as proof of their sincerity offered any farmers' club a ton of the same as a present, in order to make a fair trial, thought this open and generous offer on the part of the company demanded their utmost attention.

They therefore claimed a portion of the manure, convened a meeting of the club, and drew up rules for testing the guano against several other artificial manures, which was done in the fairest manner possible upon six different farms within the district of the club, and the crop was carefully weighed in December, 1852.

It should be stated that the trial was made under two very great disadvantages, viz., from the manure arriving late in the season, and the land being unusually dry.

The following are the results:—

On Landrake farm, in the occupation of Mr. Peter Palmer; the turnips (Scotch yellows) being all sown on the 27th of July, 1852, and weighed 20th of December, 1852:—

Manufacturer and Manure.	Price per Ton.	Price per Acre.	Weight of Bulbs per Acre.	Weight of Tops per Acre.
The Newcastle-on-Tyne Manure Co.'s Ammoniacal Guano	£ 8 10	£ s. d. 1 5 6	ts. ct. qr. lb. 18 17 6	16 6 7 0 16
Mr. Lawes's Superphosphate	8 10	1 5 6	18 11 1 20	6 0 2 24
Mr. Cridland's ditto	7 10	1 0 18	4 1 4	6 12 3 12
Mr. Purser's ditto	7 0	0 19 6	16 4 1 4	6 8 2 8

In this case one-half of the ammoniacal guano was sown broadcast, and the other half in the drill; the cultivator fearing, if the whole were put in the drill, whether it might not destroy vegetation.

On Cuterew farm, in the occupation of Mr. William Stephens, the kind of turnip was White Norfolk, sown on the 26th of July, and weighed on the 20th of December.

Mr. Norrington's Superphosphate	7 10	2 3 11	6 15 2 24	3 4 1 4
The Newcastle-on-Tyne Manure Co.'s Ammoniacal Guano	8 10	2 5 4	6 4 1 4	2 4 1 4
Mr. Purser's Superphosphate	7 0	2 2 9	5 4 1 0	2 10 0 0

The crop in this case succeeds seed, *Trifolium incarnatum*, on plain land. The committee of the club consider Mr. Norrington's manure takes precedence here, from being placed on a better and more sheltered part of the field.

On Minard farm, in the occupation of Mr. William George Vosper: White Norfolk turnips were used in this case also, being sown on the 24th of July, and weighed on the 20th of December.

Mr. Norrington's Superphosphate	7 10	1 10 9	23 7 0 16	5 11 1 20
Mr. Purser's ditto	7 0	1 10 9	22 4 1 4	4 17 0 16
The Newcastle-on-Tyne Manure Co.'s Ammoniacal Guano	8 10	1 10 9	21 18 2 8	4 17 0 16
Mr. Gill's Superphosphate	7 0	1 10 9	18 10 0 0	5 7 0 16

Here Mr. Norrington's takes the lead, but as in the former case his manure happened to be placed on a better and more sheltered part of the field. Owing to the Ammoniacal Guano being wholly sown in the drill, much of the seed was killed. The committee are of opinion that had the land been moist, instead of so very dry, such would not have happened. The same remarks are applicable to Mr. Gill's manure.

On Coldey Farm, in the occupation of Mr. Thomas Claridge, the turnips used were Scotch yellow, sown on the 24th of July, and weighed on the 28th of December.

The Newcastle-on-Tyne Manure Co.'s Ammoniacal Guano	8 10	1 5 6	10 11 1 20	6 1 1 20
Mr. Cridland's Superphosphate	7 10	1 2 6	9 17 0 16	6 0 0 0
Messrs. Smith and Gibbons's Ammoniacal phosphate	7 0	1 1 0	9 5 2 24	5 11 1 20

Mr. Cridland in this case had the advantage of the best part of the field.

On Lanjore Farm, in the occupation of Mr. John Creber, Blue Poll turnips were used, and they were sown the 15th of August, and weighed the 28th of December.

The Newcastle-on-Tyne Manure Co.'s Ammoniacal Guano	8 10	0 17 0	8 18 2 8	4 8 2 8
Mr. Pontey's Manure	8 0	0 16 0	7 14 1 4	3 7 0 16

On Hesking Farm, in the occupation of Mr. Edward Genke, the Scotch yellows were used in this instance; they were sown the 25th of July, and weighed the 28th of December.

The Newcastle-on-Tyne Manure Co.'s Ammoniacal Guano	8 10	1 5 6	12 17 0 16	7 0 0
Mr. Cridland's Superphosphate	7 10	1 2 6	10 4 1 4	5 17 0 16
Mr. Pontey's Manure	8 0	1 4 0	7 11 1 21	6 7 0 16

—West Briton.

## GRASS SEEDS FOR PERMANENT PASTURE.

SIR,—As during this month grass seeds for laying down land to permanent pasture should be sown, a few directions and observations, I think, will not be out of place, as we are not all informed alike, and some have not the time for this neglected study.

To commence with putting in the seed: dress the land well, and sow  $1\frac{1}{2}$  bushels of seed corn to the acre, harrow and roll again; then sow the 3 bushels of mixed grasses on an even surface, with a gentle breeze, that the light may be blown as far as the heavy are cast. A bush harrow should only be used to cover in the seed, and leave it well rolled, and it may be rolled again at opportunities till the corn is too high; by thus closing it, the moisture is more easily attracted to, and retained at the surface.

After harvest, the grass should be manured, to gain strength, and must not be fed off; guano might be successfully applied.

At the next year, if you cannot feed it with bullocks, it should be mown three or four times, to induce it to tiller, and if a top dressing of yard dung were applied in the autumn, I can speak practically that a thick and close sward would be obtained the first year.

In forming mixtures of grass seeds, every soil should be supplied with its appropriate mixture, both as regards succession and qualities; and as the permanent ones require time to come to maturity, some of the more short-lived should be introduced, that there may be a crop from the beginning, and also that there should be as great a variety as possible. The "Anthoxanthum odoratum," if sown alone, would yield too aromatic a quality; but, if mixed with the "Alopecurus pratensis" it becomes at once fattening, and the same with the rest. The grasses thrive permanently only when mixed, some forming herbage in the spring and autumn, and a few throughout the warmer months; if they did not closely succeed each other, weeds would soon appear.

In conclusion, I must remark, that unless the newly laid down land is rich, it will be exhausted in a few years, and will pay well for manure, as it is not annually reseeded by the plough.

H. R. SMITH.

Eastling.

## ON BREEDS OF SHEEP FOR DIFFERENT LOCALITIES.

BY JOHN DONALDSON,

AUTHOR OF PRIZE ESSAY "ON THE CULTIVATION AND VALUE OF UNDERWOOD," AWARDED BY THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

The *ovis* is a genus of animals belonging to the class *Mammalia*, order *Ruminantia*, and family *Cavicornia*, or hollow-horned; the horns belong to the tribe *Capridæ*, persistent, and placed on an osseous nucleus—the horns are often wanting. The common sheep is the *ovis aries*, and has many varieties.

It is supposed that the sheep was the first animal domesticated for the use of man. The oldest records are very unsatisfactory with regard to the existence of sheep in Britain. Julius Cæsar never alludes in the most distant manner to the sheep or the employment of its wool, when he describes the habits and employments of the inhabitants of Britain. But the conquerors soon turned their attention to the improvement of the country, and established a woollen manufactory at Winchester, which produced cloths that equalled any other in the Roman Empire.

The sheep stands in the highest class of utility to the wants of the human race. The flesh forms a very delicate and nutritious food, and the wool or hairy covering of the animal is manufactured into clothing of many kinds and qualities. Its habits are hardy, and it requires less care in the point of domesticated shelter, and is managed with less trouble than the other animals of the farm, at every stage of its existence. When beneficial alterations are effected in the arable culture of land, the improvement of the domesticated animals very speedily follows—a larger quantity of food is produced, and of better quality, which never fails to communicate to the animals the impressions which the articles that are eaten have received from the soil. And when this never-failing consequence is attended with the necessary selection in the breeding of the animals, the most valuable result is obtained, of carcasses altered in form, quality of flesh improved, an early maturity, the wool rendered more fine, and a very valuable identification of the animal with the soil on which it has been produced. In the very rapid and extensive improvements which took place in every point of British agriculture during the last century, the domesticated animals partook very largely of the vast alterations that happened throughout the whole circle of husbandry. The sheep being one of the most valuable, and being adapted for every locality in the British Isles, the animal met with much attention, and was quickly raised to a well-deserved eminence in the scale of refined animal organization.

Soil or climate exert an all-powerful influence on the character of the animals which inhabit the geographical position; and much care is required in assorting the qualities that may suit the circumstances of the locality. These circumstances will ever determine the eligibility of any organization to be placed under their influence. If this influence be not duly estimated and acted upon, the very worst results will happen, and the forms of life will be most injuriously altered, if not wholly destroyed. Every kind of life is very sensible to external impressions, and the character is fixed on every production of growth by their resistless sway. The persistent qualities are imprinted by their efficacy, and if some few changing qualities occasionally appear, they do not affect those of a greater magnitude, and which never depart. In all such cases, nature has shown the way; and it only remains to follow her paths, and mark the turnings and observe the stops.

The different localities in which sheep are used in Britain may be placed under four heads—the lowland situation, the lower highland, and the upper highland grounds, and the highest elevations or the Alpine range. In these different elevations, nature has been found to place the various kinds and degrees of animal and vegetable life. The low grounds are universally the most fertile—the soil is alluvial, deep, and warm; and being aided by a corresponding warmth of temperature, it produces an herbage that is rich, juicy and succulent. This herbage being consumed by quadrupeds, it communicates to the bodies and to the dispositions of the animals the same qualities of largeness of bulk, and of a heavy temperament. It very naturally imparts a sluggishness of disposition, and a disinclination to wander, as the food is abundant and easily gathered. It also produces an early maturity of growth, and consequently a shorter period of existence. The flesh of these hastily produced animals is flabby in its nature and loose in the texture, and wants the rigorous firmness that is derived from air and exercise. The wool is of the finest quality, as the improvement of it from a state of hair is not so sensible as the flesh to the accompanying influences that affect the quality. It is long in the staple and abundant in the quantity. Under the name of low grounds are comprehended all the best improved lands that are placed within the range of moderate elevation.

The lower highland grounds comprehend the higher cultivated lands, with a portion of the best natural pastures. This locality leads from the low situations to the more elevated grounds, and is the first step in ascending from the warm pastures to the more bleak exposures. The food is more scanty and of an inferior quality as to juicy bulk, and consequently requires animals of a smaller size, and more capable of exertion. The soil is not so rich as the lowlands, and the herbage is more scanty; the animal is quicker and more active, and produces less wool. But the quality of the flesh and the wool is not lessened from the reduction of the size of the body; for though the food is altered in the most succulent points, the essences that constitute the refined quality are more concentrated, and tend to produce flesh of a more delicate fibre and a firmer texture. The wool is similarly affected, and is rendered shorter and somewhat more crisp, but little or nothing diminished in value. In both situations that have been mentioned, the supply of winter food is understood to be ample and of the first-rate quality.

The third locality is the upper highland grounds, where little winter food is given on account of the small extent of cultivation, and where the rigour of the climate is very considerable. The steep formation of the grounds, and the bleak exposure, require an animal of an active undaunted nature; and the herbage being scanty and poor in quality would not support an animal of heavy carcase and lazy habits. This situation is tenanted by a small animal that is active, brisk and lively, and which can wander in search of its food without enfeebling the body and ruining the constitution. The wool becomes more hairy by reason of the coldness of the exposure and the wiry nature of the food—the natural functions are deferred and prolonged, and the maturity is postponed. The flesh is more concentrated and hardened—the fibre is attenuated and the juice is sweetened.

The fourth and last locality is the highest mountain range, consisting of snowy tops and alpine valleys, where snow and tempests prevail throughout the greater part of the year. Nature has also provided this sterile region with inhabitants that are suited to the rigour of its natural qualities—the sheep browses the scanty herbage, and the winged inhabitant picks the few seeds and insects that are found on the barren ground. The few animals that live in these high latitudes are slow in growth, and small in bulk, hardy in constitution and coarse in the hairy covering. The flesh is delicate in the fibre, and sweet in the juice.

Nature having assorted the kinds and natures of animals to each particular soil and climate, it remains for the care of man to improve the condition of each

species in providing a better maintenance, and in altering the nature of the animal by an alien admixture of blood which is not so far unlike or different in qualities as to unfit the progeny for the circumstances of the situation. Our knowledge of the breeds of sheep that exist in the different localities amounts to the knowing that they were found on the ground; and beyond that bare fact, nothing is known whence they came or how they acquired the distinctive qualities. The present improvements know only one case of alteration by the admission of alien blood, and that mixture was not very distant nor unlike in appearance and qualities. The other beneficial alterations have been made by using the native elements and providing a better maintenance for the improved progeny, which has been produced by breeding from the best forms. The more elevated situations do not admit of any improvement in the animals by change or by a fresh introduction, and a mixture with the better breeds would be wholly unsuitable to the circumstances of the locality.

The rich herbage of the lowland grounds, and the artificial grasses of the cultivated lands that are best in quality, maintain animals that are large in bulk, heavy in carcase, forward in growth, and rich in flesh and wool. The food being abundant and easily obtained, and the situation being warm, the necessity is not imposed upon the animal, of wandering in search of its meat or of seeking for shelter: the propensity is created and indulged of living at ease, and of producing the qualities of excellence at an early age. To suit these purposes under the existing circumstances, no breed of sheep has yet been found equal to the improved "Leicester" which was got from the natural elements that were found in the localities of richness and warmth, and by improving on the accidental productions of nature, which show a superiority over the general standard of the articles of its variety. By acting on the unerring maxim that "like produce like," and the no less necessary maxim of providing an ample maintenance for the feeding of the improved productions, any breed of animals may be improved, and also assisted, by being intermingled with the blood of a near alliance of similar qualities, but superior or different on some communicable point or points, and which may be further improved by the circumstances of the situation. This point demands the chief consideration in breeding animals—viz., that qualities be not introduced that are above the power of being supported by the situation, and where degeneracy must happen in place of improvement. It may be truly said, that no qualities are in existence which the best lands are unable to support. In that case it remains to intermix and blend the qualities in order to produce a form that possesses a greater

number of points of excellence than were previously obtained by the casual and unrestricted intercourse of the sexes. On this principle, the Leicester sheep have reached their present excellence, and have maintained the superiority against every competitor yet brought against them. The body is formed to produce much weight in little compass, being cylindrically square, compact, and firm. The offal is light and proportionally small, which is the first point in any kind of improved breeding. At the same time, the intestinal organs are not reduced below the power of performing the necessary functions. The pelt is thin, gelatinous, and resilient, and affords a ready promotion to every enlargement. The bone is fine, yet capable of carrying much weight of flesh. The head is small—the eye pert and lively, and the ear agile and quick in motion. No part of the animal body shows more clearly the refinement of the organization than the visual nerve: if it be quick and piercing, the other parts will be seen to be fine and attenuated; if it be dull and sluggish, the component parts will be found to be coarse and heavy. The back of the Leicester sheep is straight and broad, and affords ample room for lateral extension and the curvature of the ribs. The chest is broad and roomy, and allows the ample play of the lungs in acting the flux and reflux of life. The refinement of the whole constitutional organs induce the rapid growth and early maturity of the different parts, which tendency is very powerfully assisted by the circumstances of the situation. The wool or the hairy covering of the animal is equally improved with the body, and constitutes not the least valuable part of the improved animal. The fibre is fine and long, the quantity is large, and the fleece is the foremost in estimation for the most valuable application of wool. No other long wool exceeds it in value.

The conformation and the disposition of the improved Leicester sheep are exactly what the situation requires; a valuable carcase suitable to the richness of the locality, and the speedy arrival of the value at the tangible point. The refinement of the different parts of the organization naturally encourages and produces the early maturity, and the propensity is encouraged and supported by the forward qualities of the aliment by which the animal is supported. The disposition of the animal, though it inclines to ease and quietude, is not thoroughly incapable of exertion; on the other hand, its activity is fully equal to the circumstances of the locality in which it is most properly placed, on the low natural pastures, and the best cultivated lands. A lighter breed of the animal is found to be very suitable on all lands where clovers are sown, and in moderately cold latitudes. The animal is by no means delicate, as is by some supposed, when the breeding produces a thick coat

of wool, and a vigour of constitution. The very thin pelts that are now frequently seen are unfit for any but the very richest and warmest localities. In directing the sexual intercourse, very great care must be used that the constitution be not debilitated, nor the body enfeebled by breeding from two near affinities; for whatever may be said on the contrary side, the truth shows that the above results do happen from the joining of a close consanguinity. Of all points in the nature of animal life, none is more necessary than a vigour of constitution, in order that every functional organ is capable of performing the part that nature has assigned to it. The most valuable food loses its worth in being given to an animal whose intestinal organs are destitute of the necessary action to decompose and assimilate the elements of its composition. This vigour becomes more necessary according to the quality of the food, as it is rich or poor, succulent or wiry. Quiet and rest encourage the secretion of fat; but some exertion is required to stimulate the necessary action of the organic functions.

It is a fixed law of nature, that all organized bodies that grow rapidly, and quickly attain the full size, are short-lived; and the texture of the organic elements is more tender and softer in the consistency than the other bodies whose growth is slower, and the age more lengthened. In animal bodies the flesh is more loose and flabby, and the fat is less connected with the fibre. It is undeniable, that in proportion as animals are improved in quality, and rendered finer in the organization, they require food of a better quality, and also a more favourable exposure. The external circumstances must correspond with the refinements that are effected on the living mechanism.

The chief recommendation of the Leicester sheep is a great beauty and fulness of form, which contains in the same dimensions a greater weight than any other breed of sheep; a propensity to fatten almost unequalled, and an early maturity of growth that quickly fetches a remunerative value, and a very great diminution in the proportion of offal to the size of the animal. These three properties constitute, in the full possession, the points that form the greatest possible attainments in the value of animals.

The Leicester breed of sheep are polled or without horns; head, long and small, tapering towards the muzzle, and projecting forwards; the eyes are prominent, quick, and lively, but with a quiet placid expression; ears, long and thin, standing backwards, and quick in motion; the neck, full and broad at the shoulders, and gradually tapering to the head. The breast, broad and full; shoulders, broad and round, and no hollow behind

them; aim, fleshy down to the knee; bones of the legs, small and bare of wool; chest and barrel, deep and round; ribs, circular from the spine; back, straight from the root of the tail to the root of the ears; quarters and thighs, wide and full; legs, moderately long; pelt, fine and moderately thin, soft and elastic, and covered with fine wool of medium length. It is precisely the form of a sheep that must be provided with an abundance of food, and is not required to travel far, or to make much exertion in gathering it. It is therefore placed on the very best lands that produce natural pastures, or that are in cultivation and yield artificial grasses. The more hardy species of the breed will thrive under much meaner circumstances both of soil and climate, where the cultivation is good, and where the attention to the animal is proportionate. An abundance of food is most essential in every case.

The animal arrives at maturity in two years, when the female drops lamb, and the castrated males are fit for sale in a fatted state. They may be disposed of either before or after the second fleece is shorn; in the former case the animal will be turnip-fed during winter; and after they are clipped, the summer's grass will be the means of fattening the carcass. The average weight that is most generally saleable is 18lbs. per quarter, varying from 15 to 20lbs. Summer-fed animals will reach a much greater weight, 20 to 30lbs. per quarter; but large weights are not liked, nor are they so generally useful; the quality is coarser, and the fat lies in lumps and clusters, and unpalatable to many tastes. Quick maturities are all of them liable to the objection of the unequal mixture of fat and lean, and of the flesh being more loose and less firm than that of slower advancement. And hence the propriety of being used at an early period, before the faulty parts attain a disagreeable pre-eminence. This objection is very much removed by not allowing the age of the Leicester sheep to much exceed the clipping of the second fleece. At that time, the precocious growth has not arrived at the full development of the objectionable parts that attend the early maturity of the system. These faults are wholly borne down by the value of the more forward advancements.

The second locality for sheep is the lower highland grounds, comprehending the higher cultivated lands, and occasionally with a portion of natural pastures. These grounds are steep in the formation, and are poorer in the quality of the soil than the last-mentioned locality; the exposure is somewhat colder, and the herbage is more scanty. But if the cultivation be good, and the soil be of a medium quality, and the aspect be moderately bleak, the close-woolled hardy variety of the Leices-

ter breed will be very suitable, even though it require a very considerable attention in providing the requisite quantity and quality of food—turnips and clovers are essential.

In the southern counties of England, the formation is chiefly "chalk," rising into high hills that are covered with a short grateful herbage, which is generally sweet from all the calcareous substances on which it grows. These grounds require a clever animal, that is capable of climbing the sides of the hills, and of wandering in search of the food which grows more sparingly than on the rich lowland grounds. Accordingly there was found on these downs, or grassy hills, a breed of sheep that had been adapted by the continuation of nature's usage to the circumstances of the locality, smaller in bulk than the lowland productions, more delicate in the fibre, slower in growth, and the wool shorter and less in quality. These qualities have been all impressed by the external circumstances to which the organization of the body is exposed. The improvements in arable culture soon afforded a better maintenance, by which the size was somewhat increased, and the other qualities correspondingly brought forward. The animal received the name of the "Southdown" breed from the locality where they were found and improved, and are now well known over the United Kingdom.

The animal is smaller than the Leicester breed, and fitted for more exertion. It is consequently adapted for grounds where the food is scarcer, and requires labour to be gathered. It is short-woolled and hornless; the face is black, or of a black dun colour; body, short, round, and compact; legs, of a medium length, and moderately fine in the bone; breast, wide, deep, and projecting forwards, indicating a good constitution, and a disposition to thrive; twist, particularly full; head, small; eye, full and bright, but not prominent; belly, well covered with wool, which comes down to the knee and to the hock; the wool short, close, curled, and fine, and free from any projecting fibres. It fetches the highest price of short wools.

The Southdown sheep is hardier than the Leicester breed, and adapted for a greater variety of soils and situations. It is patient of short keep, and of thick stocking on the ground; the maturity has been made early, and the flesh possesses a quality in the fibre, and in the juice and flavour, that is equalled by few, and excelled by no animal in Britain. The improvements that have been made in the shape and qualities of the animal have proceeded from using the natural progeny in the best specimens, and without any mixture of foreign blood; the sheep is consequently purely indigenous, and the honest inhabitant of the soil. In the localities of the second quality, the Southdown sheep



holds the first place; and it is yet undecided how far it is inferior, if at all, to the Leicester breed, on the very best grounds in Britain. The treatment of the animal, in point of food and exposure, has produced at least two varieties; the one is improved to a degree that suits the best lands in the kingdom; but it is still confined mostly to the elevated grounds of the dry formations of South Britain, where the herbage is short and sweet, whether it be cultivated or natural. The coarser variety is used on the more inferior grounds, where the grass is less abundant and grateful, and where the winter food is more scanty. This animal is adapted for the purpose of folding on the land; and in some peculiar situations very great benefits are obtained from the custom.

For the situations now mentioned, the Southdown sheep is preferable to the Leicester breed; the animal is smaller, and more active in climbing declivities and in gathering a more scanty food; the wool is of equal value, and the quality of the flesh is superior. It is adapted for a greater extent and variety of situations, comprehending the whole circle of cultivated grounds from the very first-rate quality to an altitude that forbids the use of lowland sheep.

The third locality that was mentioned is included in the range of the highest cultivation of crops and the grassy pastures that extend to the beginning of the Alpine range. This elevation exists all over Scotland, and the north and west of England, sometimes accompanied with a portion of cultivated grounds, and very often with none at all. This position of pasture grounds requires an animal of a medium quality between the sheep of the lowlands and the goat-like climber of the snowy regions; and it has been most admirably found in the "Cheviot" breed—so called from the hills of that name, which separate England and Scotland, and where the animal was found, and yet lives, in the original purity. The beast is hornless and wholly white in colour; eye, prominent and lively; countenance, open and pleasing; ear large, and distant from the eye; back, straight; ribs round, and quarters well proportioned; legs, clean and small-boned; pelt thin, and very thickly covered with short fine wool. The thighs are well covered with muscle and wool down to the knee; and although the wool be rather coarse on the thigh, the quantity very amply compensates for the want of quality. The maturity is complete at the age of 3 years, when the weight varies from 12 to 18 lbs. per quarter. The flesh is of the first-rate quality.

This animal forms one of the most valuable breeds of sheep in Britain. It is very patient of wetness and resists much cold, and thrives in all situations where the grazing and shelter are in any way

tolerable. And when it is transported to improved situations, no animal is more profitable, as it fattens quickly, and the wool and flesh bring the highest price. It has been introduced with much success upon the hills of Wales and of the north of Scotland, where the elevations are not the very stormiest, and where a valley pasturage is joined with the range of hills. The circumstance of some winter keep being given, has yielded a superior variety of the animal which inhabits the lowland range, and is well qualified to be fattened on the best lands in Britain. A cross-bred animal of much value, is got from the Leicester ram and the Cheviot ewe, in which both the wool and the flesh are much improved. This advantage very conveniently occurs in the last year of the breeding from the ewes, and before they are fattened for sale. Thus it is seen that the "Cheviot" breed of sheep are capable of being applied to many useful purposes, than which no greater recommendation can be possessed by any article, either animate or inanimate.

The fourth and last locality that was mentioned, is the highest elevation of mountainous tracts that are found in Scotland and in Wales, and where snows and tempests almost universally prevail. Nature has not left even these inhospitable regions unpeopled or untenanted—sheep were found there as well as on the richest lowlands, and are seen to be impressed with the permanent marks of the external influences to which the organization is exposed. A black-faced horned breed of sheep was found over the whole of Scotland, and in the north-west counties of England, altered in some cases into varieties wanting horns, and the bodies being dun in colour, and the faces mottled. They have ever lived in the greatest purity on the Lammermuir hills of the south of Scotland, and in the county of Selkirk, both of which situations are not far removed from the native land of the Cheviot breed, to which they are as dissimilar as can be imagined. How two breeds so very unlike to each other came to inhabit two districts so near in situation, neither history nor tradition has attempted to explain.

This animal is mostly horned, more or less spiral in form; the female is most frequently without horns. The faces and legs are black, or sometimes mottled—eyes, wild and fierce. The wool is open and long, coarse and shaggy. The hard crispy feeling of the wool lessens its value. The mutton is of the first-rate quality, being unequalled in colour and in flavour. It is always best in quality when fed on the mountain; the wild and restless nature of the animal renders it very unfit to be fattened in a lowland enclosed country. Much of it is sent in carcass to London by steamboat, and to other large

towns. The only fault, with the butcher, is the thinness of the fore-shoulder.

The crossing of this sheep with any other breed has wholly failed, but the original animal has been very much improved by judicious selection. The best maturity is the age of 4 years, when the average weight will be about 16 lbs per quarter. The wool is small in quantity, hairy and coarse, and of little value; but the flesh is excellent, tender and juicy, and resembling venison in the black colour which it assumes. It is much relished by amateurs in animal flesh.

This breed yet holds the undisputed possession of the highest alpine pasturage on the mountains of Scotland. The Cheviot breed approaches to the foot of the heathy range, and there stops: it thrives on all green and comparatively low grounds, but cannot advance beyond these limits. And no other breed has yet been found to progress so far and invade the territory of the original tenants—an animal capable of resisting the number and the power of the external influences of the locality will be very rare if at all to be found, and to raise a new breed from any existing elements to suit the very peculiar circumstances will be a very difficult, if not a hopeless attempt and very remote from the lowland situation, where the opposing circumstances are fewer in number, and less virulent in their nature. In such cases, the sure way to improvement is by working on the existing materials by means of using the best parts for the purposed of reproduction.

The mountains of North and South Wales have been occupied from time immemorial by a small hardy race of sheep, differing only in the one point, in the northern animals being mostly polled, and in the south they are mostly horned. But both kinds are often intermixed, and many are found varying in colour between a dirty white and a perfect black. The head is small; neck long, erect, and delicate; the fore-quarters light, with narrow breasts and shoulders; the sides flat; the back and loins narrow; the legs slight and long. The animals possess much agility, and a very unquiet habit, and are very troublesome when confined in enclosures. The fleece seldom weighs above 2 lbs.; it is coarse in quality, and brings a very inferior price. The mutton is uncommonly fine; delicate in fibre, rich in flavour; it always commands a higher price, and a large quantity of it is sent to London. From the irreclaimable disposition to wander, and other causes, the breeding of the genuine Welsh sheep has never been pursued in England, and they are still confined to their native mountains, where no other breed has been yet found that is so well adapted to the climate and the herbage. In the situations which possess a valley pasturage

along with a midway mountain range, the Cheviot breed has been introduced, and successfully; but, on the highest mountains, and on the unmixed alpine range, the aboriginal breed yet most firmly hold their ground. The animals may be very much improved in quality by a judicious selection in breeding from the best forms; though it is questionable if any increase in the size of the carcass would be advisable. The wethers require full four years to arrive at maturity, and then weigh 40 to 50 lbs. at an average. The mutton is much best in quality when fed on the mountains.

There are some other breeds of sheep in England—the Cotswold, Dorset, and Ryland—but not possessed of any superior excellence to entitle them to a separate notice. In the case of heavy sheep, the Leicester breed supersede all others; and the Southdown sheep, in the several varieties, is very applicable to all situations extending from the very best lowland and cultivated grounds, to the commencement of the best hilly pastures. From that point the Cheviot breed occupies the ground to the foot of the highest alpine range, where the black-faced Scotch breed and the small Welsh sheep retain the undisputed possession.

In improving any breed of animals, or in producing a new breed from the consorting of elements that are dissimilar, and which will retain the permanent qualities, the difference in the natural properties must not be very great, or the gap will be much too wide, and may never be filled up so as to produce a beneficial meeting of the extremes of separation. Animals that are bred on the ground possess a most prodigious advantage over any foreign introduction, and it requires a very considerable time to reconcile and inure the constitution of animal life to the circumstances of external influence. The latter power very often proves too strong to be withstood by the organization of the elemental structure, and totally destroys the hopes that were entertained of a beneficial change. The failures of new introductions that have been made, either in the whole animal, or by bringing forward more refined elements in a definite degree, have arisen from the ignorance and neglect of the considerations that are due to the obstacles which will be met, and the influences which will occur. The Leicester sheep has been produced by consorting elements that were exposed to similar affections, and which when joined and mutually refined were capable of withstanding the circumstances under which they would be used in the same situations. The Southdown breed has been got by using the best elements of the native locality without any foreign blood; and in proportion as the animal was improved, the maintenance was also changed into a greater supply and of bet-

ter quality by means of the improvements in arable cultivation. It is a fixed law that animals which are improved in quality require a corresponding degree of better maintenance, and this truth should always be strictly borne in mind in the attempts to improve the structure of animals. If the food be deficient in quantity and quality, the properties of the animals will tend to accommodate themselves to the quality of the nutriment, and the tendency will be further aided by the external agency of the exposure. These most certain truths will ever direct the success or the failure of the introduction of the Leicester or Southdown sheep in to any strange locality. Constant wetness, rather than cold, is pernicious to sheep, and more so than the food that is eaten. This property of the climate is the chief consideration, and the next is the capability of the soil to produce the necessary food. If these two elements do not exist in the necessary degree, the attempt should not be made.

The localities of the Cheviot, Black-faced, and Welsh breeds of sheep, do not admit the introduction of any foreign elements of better quality, which are wholly alien to the circumstances of the situation. They would dwindle into insignificance, and speedily disappear altogether. The only improvement is to be made by choosing the best qualities for the purpose of perpetuating in the progeny, and which accident will ever produce in every succession of organized life. These refinements are the offspring of the locality, are inured to its influences, and are capable of living under its laws. But even in this case there is a danger of overstepping the power of the nutriment to support the improved organism, and very considerable judgment is required in operating in this way, as the situation does not admit the aliment being improved by cultivation. But very considerable improvements may be effected before that point of discrimination be attained.

## MINERAL AND OTHER MANURES: THEIR ACTION AND VALUE.

BY C. L. FLINT.

It has been found that the functions of vegetation correspond in some respects with those of animal growth. Plants may be said to require food; and they have all the organs necessary to assimilate it. The tender fibres of the root absorb the sap or the juices on which vegetable growth depends. The stems convey these juices to the light and the air. The leaves are the lungs, as requisite to the healthy development of the plant as the roots themselves. And these analogies might, with truth, be carried even farther.

To cultivate, is only to assist the plant in obtaining its food by furnishing to it such substances as its composition requires, and the intelligent cultivator adapts these substances to the wants of the particular plant which is the object of his care. By the same process—the analysis of the plant—we learn in what the relative fertility of any soil consists, for it is obvious that the fertility of any soil must be relative to the plant we wish to raise in it; that is, what would be found to be a fertile soil for many plants, might be wanting in the substances which many other plants require.

We could not arrive, in our inquiries, at any valuable practical results without first knowing the constituent parts of the plants themselves, and the composition of the arable soil which forms the surface of the earth, and in which these plants take root. It will be well, therefore, to devote this paper to a brief statement of them, even though they may be already known to most readers.

The constituents of plants and of the soil have sometimes been divided by scientific men into *organic* and *inorganic*. The organic matter of the plants is that which can be destroyed by fire, and which cannot by any artificial means be reproduced or imitated in the precise forms in which it appears in the growth of plants. It is the result of chemical processes which are constantly taking place in nature. So far as it exists in the soil, it is of a dark colour, consisting of decayed vegetation and of decaying animal and vegetable manures that are applied to the soil. Besides furnishing ammonia, carbonic acid, &c., its colour retains greater heat, and thus stimulates the process of vegetation. By far the largest part of the weight of every plant is made up of this organic matter, amounting, in most cases, to more than 90, sometimes to more than 99 per cent. It consists of four chemical elements—carbon, and the three gases hydrogen, oxygen, and nitrogen. From these with the aid of a few inorganic substances are made all the infinite variety of plants and flowers which cover and adorn the whole surface of the globe. Hydrogen and oxygen exist in sufficient abundance in all soils, as well as in the atmosphere. Carbon (better known as charcoal, soot coke, or bone black) enters in the shape of carbonic acid gas through the leaves and roots of plants. It forms an exceedingly small per cent. of the weight of the air, which is 79 nitrogen and 21 oxygen. It is supplied in considerable quantities by decaying animal and vegetable matter. From its

great weight compared with the other parts of the air, it rests much upon the surface of the earth, ready to be taken up by the plant. It is found in the ashes of plants. Burning and decay, indeed, are processes precisely similar, except that the one requires a greater length of time. The results are the same, so far as any fertilizing properties are generated. Potash and soda readily combine with carbon, and enter the roots in the form of a gas. These alkalis exist in great quantities in many soils; and where they do not, we shall see how they may be profitably added. Nor should this organic constituent be considered unimportant, since it forms a very large portion of all the most valuable productions of the farm. In one thousand parts of hay, for instance, four hundred and fifty-eight are carbon; while in oats the proportion is still greater, being 507 in a thousand.

The inorganic matter of plants, on the other hand, is found in the ashes, or in that part of the plant which is left after burning, and which can be artificially made. It consists of a mineral substance, such as silica (sand), alumina (clay), lime, potassa, soda, magnesia, &c. It is to these mineral substances, which can be artificially supplied, that our attention at present will be chiefly directed. And the intelligent farmer will not scorn to study and apply these to increase the fertility of his soil.

One great purpose which these earths and alkalis serve, is to give strength to the stalk of the plant. Add an amount, however great, of vegetable or animal manures to the soil, yet the change of these into inorganic matter cannot be effected without the aid of inorganic substances. If the soil wants these, the seeds may grow, but they cannot arrive at maturity, or attain to a perfect development. In some soils nature has provided them in almost inexhaustible quantities; but on most arable land a successive cropping will exhaust them, leaving the soil in an inferior condition unless they are artificially mixed with it. The most direct way of doing this is to apply the mineral substances, such as ashes, lime, gypsum, &c.

If we observe the crop on a rich and deep alluvial soil wanting in potash, lime, or sand, we find it very rank or weak. The grain is not well filled out. We say it "runs to stalk," and both the stalk and the ear suffer from the want of inorganic matter in the form of mineral manure, to give it strength. The amount of decayed vegetable matter, in proportion to the inorganic mineral substances, is too great. Let these be added, and the crop will be increased in quantity and value. On a soil of an opposite character, composed of lime or clay, or in which these predominate, we find the crop strong and healthy, but small in size and quantity. The inference is that vegetable and animal manures are

wanted in greater quantities, while neither of the mineral manures may be needed.

Plants then have the power of taking up inorganic substances, and of retaining some and rejecting others. And it will be our object in these investigations to point out those substances adapted to assist particular plants, and the most judicious application of them. And whatever may be said, will not be the deductions of theory alone, but the result of experiments which we ourselves have made, or which have come directly under our own observation.

And first of ashes, which are the inorganic matter of plants. It is well known that the ashes of various substances differ widely both in quality and quantity. Wood ashes, for instance, are far less in quantity in proportion to the weight before burning, than peat or coal ashes, while both science and experience have shown that the former are of far greater value in the soil than the latter. The reason is that they contain a larger amount of alkalis, which are indispensable in all soils. And further, the ashes of hard wood are far more valuable than those of soft. The ashes of the beech tree are more powerful than those of the pine, since they are richer in lime, potash, alumina, and sulphuric and phosphoric acids. The quantity of potash is also very different at the various stages at the growth of plants, being greater when they are young and vigorous, and decreasing as they flower and come to maturity. Different substances also appear in the fruit and stalk of plants. If we give back to the soil from which it was taken the ashes of the stalk of the cereals, as wheat for instance, we return nearly all the lime, the phosphoric acid, and the silica, while the soda and the potash would not be restored. This is an important fact for the farmer to remember, for the plant must always have such substances as are found in its ashes, and if these are wanting in the soil the growth of the plant is greatly obstructed. The return to the soil, therefore, of such substances only as are found in part of the plant might not be sufficient to prevent an ultimate exhaustion of the soil.

#### ASHES.

Having premised thus much upon the nature of soils and of plants, we come next, in our investigations, to the practical question whether the results of experiment, and observation of the various applications, in the nature of food for plants, correspond with the deductions of science and theory. And first of ashes, or the carbonate of potassa, of which we have already spoken generally.

The value of ashes as a manure has long been known to the chemist, but it is only recently that the attention of New England farmers has been called to it in such a way as to lead them to try the experiments proposed. Now we know whole neigh-

bourhoods in which not a bushel of ashes would be sold by one who has a rood of land to cultivate; where any farmer would rather buy at fourteen cents a bushel, than to sell at the same price.

Many plants require a certain amount of potash, and it is as indispensable to them as common salt is to an animal. A soil may be rich in ammoniacal manures. It may be black from the great quantity of vegetable and animal substances which have been applied to it in successive years, and yet if destitute of potash, it will not produce, with success or profit, any of the plants whose ashes abound in the salts of potassa. These plants may flourish even for years in the same soil without the artificial application of potash, owing to the large amount originally contained in it. But it requires only the exercise of common sense to see that a system of culture which did not return the substances so largely taken up by these plants to the soil, would be an expansive and selfish system. It often happens, where this system has been followed for years, till the land is said to be old and worn out, that the judicious application of potash in some form or other will revive and fertilize it.

It was for the purpose of testing the truth of this statement, that we made a series of experiments and observations during the present season with ashes, leached and unleached, as well as with coal ashes.

The applications were made on land under garden cultivation, as well as on grass and pasture land. The nature of the season is fresh in the minds of every one. If not unusually dry, the drought commenced at a time peculiarly unfavourable, to top dressings of all kinds. The soil was a dry sandy loam, exceedingly porous, which had been richly supplied with animal and vegetable manures, till it might be said to have been literally sated with them.

We would suggest, in passing, that one of the best modes of treatment for such gardens would be to take off some two or three inches of the surface as soon as the vegetables are removed in the autumn, and fill in with a stiffer clay soil. By this means, the seeds of weeds and the eggs of many a vermin would be removed, while the soil taken away would be valuable to spread on the pasture, and that applied serve to modify the loamy and too porous soil of the garden.

It may be admitted generally, that a garden soil should be light and porous, so far as to enable it to absorb the dews of night, and admit the free circulation of the air; but it will often be found that such soils have no retentive qualities, so that whatever moisture accumulates at night rapidly evaporates. And here is where the effect of ashes will be most immediate and perceptible. Ashes serve to retain the moisture as well as to supply the plant with some of its most indispensable ingredients.

On the soil which has been described, leached ashes were applied in the proportion of about a hundred and fifty bushels to the acre, slightly covered beneath the surface. The result fully justified the expectations which had been raised; for while many gardens were parched up and almost ruined, the portions of the one in question to which the ashes were applied continued to look green and to produce with luxuriance throughout the summer.

The effect on the potatoes was particularly noticed. They suffered none from the disease, but came out very fair and beautiful. With those the ashes were applied in the hill, a small shovel-full of barn yard manure and an equal quantity of coal ashes in one case, and wood ashes in another. Both experiments succeeded. Wood ashes are undoubtedly better so far as any nourishment which they supply to the plant is considered. The potato may be called a *potassa plant*. A very large proportion of the ashes of the potato is composed of the salts of potassa. This is also the case with turnips and the grape vine. By the application of potash in the shape of ashes or otherwise any soil would produce potatoes or turnips many years in succession without suffering any diminution in fertility. In two or three instances which have come under our observation, both this season and last, coal ashes were used in the hill with potatoes, and in each instance with the highest advantage. The potatoes showed no signs of disease; while in fields next adjoining, there were seen the effects of the rust. We do not suggest the want of potash in the soil as the cause of the potato disease, but would recommend the free use of ashes as a manure for this plant.

Anthracite coal ashes contain carbonate of lime alumina, and oxide of iron. The amount of potash in them is very small, but we think that experience has sufficiently shown that they are worth saving.

The question is often asked whether leached ashes are as valuable as unleached. For potatoes, turnips, wheat, and a few other plants, they undoubtedly are not. But for the soil permanently, and for most plants like clover, peas, &c., they are perhaps even more valuable. The lime added in leaching repays, to a great extent, the loss of the alkalies. So that through the unleached produce the most immediate powerful effect, the leached will be found in the end more economical. The great amount of carbonate of lime which they contain, makes them particularly valuable for clover and grass lands. Clover, it should be recollected, is a lime plant; and it will not flourish in a soil in which the lime is wholly or partially exhausted. It often happens, therefore, that where clover once grew and has run out, an application of leached ashes has caused it to come in and grow with great luxuriance, and this too without the use of any seed. Hence the great utility

of leached ashes on pasture and on mowing lands. The greater part of the weight of the ashes of clover is composed of lime salts, and without the artificial application of these to the soil, they soon become exhausted and other grasses come instead of clover. Add the carbonate of lime in leached ashes, and the clover will continue to flourish, where it already grows, and will come into soils where it did not grow before. The pea is another lime plant, and it will be found very unwise to try to cultivate it on the same spot many successive years without the application of lime, either in its clear state, or, which is perhaps better, in leached ashes:

As a top dressing on light soils leached ashes will be found, all things considered, superior to most other manures. For while they generally increase the crop of grass one half, and often much more, they cannot be said to exhaust the soil. Nor is the expense so great as to be a very great objection to this use. They are worth more on the soils, which we have described, at seven dollars a leach (which contains a hundred bushels) than the manure at the stable at four and five dollars a cord, which is the ordinary price.

On soils of a stiff clay character, leached ashes will not be found to operate so well. Such soils do not need ashes as a retainer of moisture. The animal and vegetable manures will be found more va-

luable for them. But in the compost with muck and peat earth they will serve an admirable purpose. They neutralize the acids, which always exist in such substances, and thus make a valuable compound of what would otherwise be of comparatively little value if applied fresh.

The farmer should not conclude that if the ashes have no very perceptible effect the first season, they will therefore produce none at all. If the stalk of the plant is not more rank with ashes applied, than its neighbour without, the ear may be longer, better filled or heavier. If the pasture is of a very thin soil, gravelly, or covering a ledge, a drought may be so excessive as to parch it up, in spite of a rich application of ashes; but it would not follow that the ashes were of no value on such a place. When sufficient moisture comes within reach, the ashes will find it, and apply it to the use of the clover and the other grasses. The valuable properties of ashes are not, like those of some other applications, dissipated and lost in the air. They are the essential inorganic elements of plants, and if once applied they remain till taken up and used in some shape or other by the processes of vegetable growth. Let no one think, then, if no immediate effect is perceptible, that money has been misspent and lost. In due season he will reap, if he faint not.—C.L.F.—Boston Journal of Agriculture.

## ON PLOUGHING.

BY MR. MELVIN.

The subject brought under discussion, at the meeting of the Mid-Lothian Agricultural Society on November last, was Ploughing, which was introduced by Mr. Melvin, Bonnington, who said: It seems fit and proper that this Society, holding as it does, an annual ploughing match, should devote one quarterly meeting to a discussion of the subject of ploughing in its various bearings; for in these days, when so much is spoken about the science of the art of agriculture, the more humble but equally important mechanical operations are apt to be overlooked. It is more, therefore, for the purpose of stirring up thought and gaining information, that I have volunteered to introduce the subject of ploughing, than from having the power or the ability to communicate fresh facts to the meeting. Without, therefore, proceeding to discuss the question whether Triptolemus was the inventor of this operation, or the sow as Jethro'full asserts, nor detailing from the works on agriculture the history of the improvements effected on this implement, I would merely mention that this district was early supplied with the Dutch or Rotherham plough; the Earl of Stair, when resident at Newliston, more than 100 years ago, having sent a smith called Dalzell to England, for

the purpose of learning the construction of that implement, which then had been recently introduced, as it is believed, from Holland. Small long afterwards adopted, this plough as the model on which he wrought his improvements. I shall now proceed to consider what is the use of ploughing. The chief object of this operation is pulverization of the soil, and the destruction of weeds which may infest the crops it is desired to grow on it. There seem to be different opinions as to how this implement is to effect the desired pulverization, one class, the largest, maintaining that the action of the plough ought to be merely preparative, that the furrow-slice should be clearly and truly cut, smoothly raised by the mould, and placed, with as slight an alteration in its form as possible, in the desired position. The others say, that as pulverization is the object, the furrow-slice should be thoroughly broken, and thereafter left completely unconsolidated, as that the air and moisture may penetrate freely through it. Let us examine shortly these two views. It is generally allowed that the perfection of pulverization is produced by digging. Now if we examine the manner in which the gardener digs his land in autumn or winter, we shall see that with his spade

clear and bright he goes deep, and turns up the soil, lifts it a certain height, and impacts it together by its own weight, leaving the spittle undivided, with so much surface exposed to the air as the nature of the soil will allow. He does not set about cutting it into small portions, or minutely dividing it, but leaves the rest to the weather. The plough cannot imitate the whole of this process. Whether in the course of time, with the soil clear of stones, steam power may work some giant spade or grubber-cultivator, it is not for me to speculate on; but in the meantime, it is the plough we have to do with; and I maintain that the object to be gained by the use of that implement is to turn over, and place at the angle of greatest exposure, the greatest amount of soil with the least expenditure of power. Any plough, therefore, that breaks the furrow, and has not the power of again forming the soil turned over into the angle of greatest exposure, is defective. When land is ploughed during winter, and the plough made to break the furrow thoroughly, what, I ask, is its condition in spring? Why, the surface is thoroughly battered and flattened, affording nothing for the air to act on, nor cover for the seed. It being capable of demonstration that when soil is turned over by the plough, if the furrow-slice is laid at an angle of 45 degrees, the greatest amount of surface is presented; should the slices, therefore, not be laid in a uniform manner—should they be ragged, open, and broken—there must therefore be a loss of exposed surface. The only cases where immediate pulverization is desirable in ploughing, is for green crop in spring, or the working of summer fallow. If people will persist in ploughing land when it is too wet, we must confess that there the smooth system of ploughing may not prove advantageous; but this is no reason why it should not be practised where the soil is in a proper state for working; besides, it is an undoubted fact, that in ploughing lea for oats, the more closely the furrow-slices are closed, grasses put under, and the more thoroughly they are impacted together, the better the chance of a good crop following; hence the reason for the use of the furrow-presser, where the operation of the plough produces loose open pulverized work, and the requisite consolidation cannot be otherwise obtained. Having now stated my view as to the subject of pulverization, I shall allude to the form of the furrow-slice. I am well aware that I need not expect an unanimous approval of the views I hold upon this subject; for I still adhere to the old-fashioned notions, that the most proper shape of furrow is that of a rectangle, say 9 by 6 inches, or 10 by 7 inches; and the plough which most truly and smoothly cuts, lifts, turns, and closes a furrow of these dimensions, is the one I approve of. I am also aware that in the ploughing of lea, another shape of furrow is the one which obtains most favour in the eyes of many of the

members, viz., a furrow of say 8 inches broad, 6 deep in the land side, and  $4\frac{1}{2}$  or 5 in the furrow side; and I must confess that as this form of furrow has been advocated, and is practised by the best and most accomplished ploughmen who contend for victory at our annual match, and as those members of the Society who themselves have bestowed the most attention to the construction and work of the plough countenance and support this system, my daring to raise a voice against the practice may be looked upon as somewhat presumptuous, and I may meet with a reception which those sometimes got, who put their fingers into other people's broth. Be this as it may, the system, however powerfully it may be supported, seems to me most pernicious in its results, and the sooner it is departed from the better. Its strongest advocates recommend it only in lea; and the reasons assigned for its adoption are, that considerably more furrows can be put into a ridge, and by turning up the thick edge of the furrow the plough puts each furrow perfectly close to the former one, preventing the seed from falling to the bottom, and being covered deep, and also that by raising a high crest or shoulder more cover is afforded for the seed, less harrowing is required, a more regular braid of grain is had, and the crop is more uniform and ripens evenly. These, no doubt, are all great advantages, provided that this form of ploughing secures them. We deny, in the first place, that it does; and, in the second, we assert that in the attempt to effect this form of furrow weighty evils arise. For, in order that the plough may cut such a furrow, it is requisite that it should be trimmed in a particular manner. Very few of our blacksmiths know how, and still fewer of the ploughmen know the precise shape the sock should have, or the required twist in the coulter to make it cut under; and the fact, which is common to all ploughs, viz., that each requires to be tempered in a manner peculiar to itself, aggravates the evil; as greater skill is needed to discover the right working trim of the implement, and thereafter adapt the cut to the raising and turning powers of the mould. The consequence is that a few only of the more skilful, handy, and dexterous of the ploughmen, can attain to a certain knowledge of how to set their irons. The great majority vainly strive to imitate them, but rarely succeed, and all the while are making much inferior work to what they would if they had devoted the same attention to turning a furrow not so sharp in its apex, but in reality of better proportions than the other. But the mischief does not end here; for, deny it as you may, let the judges at a match decide that a furrow cut thick on one side, and thin on the other, is the best, and it is no easy matter to prevent all kinds of land being ploughed in the same manner, to the manifest injury of all true cultivation. Are the supposed advantages of such a furrow at all commensurate with

these heavy drawbacks? We think not; for, in the first place, a furrow 8 by 6 and  $4\frac{1}{2}$  contains much less soil than one 9 by 6; and a pair of horses can easily enough draw that, it containing 54 inches of soil, the other only 42. Should the horses not walk faster in the one case than the other, there must be the loss of one-fifth the time. Then does the turning up the thick side of the furrow allow of the several furrows being impacted more closely together? We think sufficient consolidation can be effected by a proper form of mouldboard. Does the high shoulder or crest afford more cover for the seed than one set up at an angle of 45 degrees? Mr. Slight, in the first edition of the Book of the Farm, has most satisfactorily shown that it does not; and I would desire all the admirers of high-shoulder ploughing to read his very clear and convincing remarks. Then as to uniformity of crop and regularity in ripening—the best specimens of this kind of ploughing do no doubt afford these results; but I maintain that these results are arrived at in spite of the faults which are inherent in the mode, and that it is the equality and regularity of the work which produce them and have not the slightest hesitation in stating that if the same skill and the same perseverance had been expended in producing rectangular-shaped furrow-slices, and closing them in a proper manner, far superior results would have been arrived at; for it is either unnecessary to do more than put a fine finish on the surface, or it is a mistake to allow a portion of the active soil to be unmoved on the subsoil. Of the various reports of the superior produce of land ploughed with a high-crested furrow—there can be no doubt that several such are known, such as the one from Mellerstein, by George Baillie, Esq., in the "Kelso Mail" of July 1844, the Union Agricultural Society's match being held there, and Thomas Kerr the winner. It was found that the land ploughed by him afforded nearly 2 bolls more oats per acre, than did the lots adjoining. But this is by no means a fair comparison, for the conditions were not the same. In Kerr's mode of ploughing, sowing, the forcing of a shoulder, there were none of the drawbacks such as square-cut furrow-slices, standing on end with wide open seams, or shakyl, loose work; besides, in the closing furrows of his ridges, the least possible space was left without a covering of soil, so that the whole ground may be said to have had soil enough for growing a crop. Then, as to the report of Mr. Allen, Clifton, in regard to this Society's match on his farm, the winter before last, when between the three best-ploughed ridges and the worst, there was a difference of 2 bolls per acre—I have only to say that, in my opinion, a better illustration could not be found of the evils of the high-crested or shouldered system, for the work which gained the 3rd prize was not highly forced; it was equal, regular, and the closing furrows of the ridges were well taken up, while the worst was just

the complete failure of an attempt to force highly, but being practised by a man who did not understand the setting of the irons and the temper of the plough; and the work done was ill-turned, unequally cut, loose, open, and rugged, while the closing furrows were so widely taken out, that more than 1 foot and a-half of surface was nearly bared of soil. Now I am sorry to say, that work of this description is too common; and until our ploughs are constructed on a principle which shall enable the great body of the ploughmen to make true and sufficient work, I do not hope to see it remedied. Before proceeding to the examination of the mode of working of the various ploughs used here, I shall make a few remarks on the changes which modern cultivation has produced on the soil. Draining, certainly, has altered the texture of the soil exceedingly, and the old hollow mouldboards are very ill-fitted for ploughing many of the stubbles; for a portion of the earth gets lodged upon them, and there it adheres; while in place of the furrow slipping smoothly over the polished metal surface, it receives ample enough pulverization by being rubbed aside on the compacted earth lying on the mould. To remedy this state of matters, full-breasted barrelled moulds were framed; but these being kept very short, did not work to expectation: although decidedly better than old concave ones, a longer shape is now needed. Then, again, it is not considered necessary to give a green crop the same number of ploughings as formerly, and the grubber is now much more used in spring, which fact renders it essential that the fewer furrows the soil gets should be the more effectively done; for gainsay it who may, after a good many years' experience of the grubber when less used than now, I can assert that deeper ploughing is required to counteract the binding effect which that operation has on most soils. It therefore appears to me, that all stubble land intended for green crops should be more deeply ploughed than it is at present; and to do this, two horses on most soils are not sufficient, as eight inches is all the depth that can be turned with them without oppression; and it seems essential that three be yoked to the plough, so that a depth of 10 inches may be reached, and soil or subsoil turned up that depth; and with two three-horse ploughs, and one with two horses to begin and finish each furrow, fully as much work will be done as with four two-horse ones. I am much in favour of having four horses put into a plough of stronger and larger proportions than the two-horse one; but working in this way, either more strength must be kept on the farm, or the labour falls behind. Should all the land at the commencement of each rotation have received a deeply cut and truly-turned furrow, a lesser depth will be sufficient afterwards; and a furrow-slice measuring  $6\frac{1}{2}$  inches seems to me enough for the seed-furrow, after potatoes or turnip, or lea or hay stubble. In ploughing a



furrow of that depth, and 9 inches or  $9\frac{1}{2}$  broad, I find that by the dynamometer, the horses must exert a force of  $4\frac{1}{2}$  cwt.—an ample enough draught for two horses. For these reasons, I am therefore inclined to advocate the use of two descriptions of ploughs on each farm—the one for stubble, of which there may be either one or two, according to the extent of larger dimensions, and fitted for turning a 10 or 11 inch furrow, while the two-horse plough ought to be constructed for a  $6\frac{1}{2}$  inch one. With these remarks I shall now consider the various kinds of ploughs, and here we have seen that the Dutch or Rotterdam plough early superseded the old Scotch plough in this quarter. Small's again were never great favourites here, and early gave place to Wilkie's, which were again supplanted by Mr. Cunningham's. This gentleman devoted much time and thought to their construction, and he succeeded in framing a mouldboard, which was almost universally used in this county. The most of the matches were gained by ploughs bearing it; and until the county match at Dundas, it was considered the first. Borrowman's plough, after that, was tried by several people. It again has given place to Ponton's; and Mr. Cunningham, although retired from the business of farming, is still as devoted as ever to the improvement of the plough; and, with the advantage of leisure, he is employing it in the adaptation of the mouldboard to the requirements of the soil in the present day. All of these more recently constructed ploughs act more or less on the principle of raising a high shoulder and leaving a heel. On that ground they appear to me to have originated in an erroneous idea of what constitutes true ploughing. The English ploughs, on the other hand, although not formed for taking so deep a furrow in general as our Scotch ploughs, are not constructed for the purpose of raising a high crest, but with their straight coulter and broad shares, cut the furrow fairly out, while they possess ample power in the mould to give the furrows sufficient consolidation. Although I have seen the ploughs of several English makers at work, including Ransome's, the only one I have in my possession is Busby's of Bedale, which gained a medal at the Great Exhibition, and also the first prize, for deep ploughing, at the English Society's last meeting. It is most ingeniously constructed, and, apart altogether from the wheels with which it is supplied, there is much about it which could afford hints to the Scotch makers. Of course, as it works on a different principle from that of the plough used here, and has no pretensions to set up a high-crested or shouldered furrows, I do not expect that it will meet with much favour. But I am not without the hope that furrows cut in a rectangular form will again prevail, and that long convex mouldboards will get into fashion. Already Ponton's Perth prize plough is said to be  $4\frac{1}{2}$  feet

long, from the point of the share to the backmost part of the mould, which exceeds that of Busby's by 2 inches; and it is pleasing to observe that the deductions from true science are not often wrong, for in the description of the formation of the mouldboard, in the "Book of the Farm," by Mr. Slight, already referred to, a mould very similarly constructed, was worked on Howard's ploughs. The mould of Busby's has much of the same shape, but is on the whole of a more beautiful form, and the curves are as fine as those of the wave line. It appears to me that the mouldboard of Busby's plough is well worthy of attention for general application, because it carries far less earth along with it. After trying it in all weathers and states of soil, I find that, although not invariably, it generally throws off the soil smoothly and sweetly, and it does so when the earth adheres firmly on the moulds in common use. In comparing the draught of my swing plough with this one, I find comparatively little difference, and what there is, is in favour of Busby, but it weighs 7 stones (it weighs  $2\frac{3}{4}$  cwt.) more than they do, and appears to me needlessly weighty in the beam. The stilts are rather short, however. The soil of England, for which it has been constructed, contains none of those boulder stones so frequent here; neither are there any trap rocks just under the surface there. Of course, its cast-iron share will hardly go a round without breaking; but by making it of malleable iron, it can be made to work pretty well, although I must confess, I regret exceedingly that cast-iron shares will not do here, for an immense amount of running to the smiths would have been saved, as well as much expense and many quarrels. Those shares, being hardened on the under side, are always sharp, and always preserve the proper form for cutting the under surface of the furrow, and the fancy or ignorance of the ploughman or smith can make no alteration on them. The existence of rock or stones will also interfere with the proper working of this plough; but this may be got over by some alteration in the relative proportion of the parts, as the stilts are too short to give the ploughman full command over it, and the beam rather too long perhaps for hand-turning, or quick work. In regard to the wheels, I conceive that in the ploughing of lea, or wherever there is a firm surface for them to work on, they are of advantage in equalizing the draught; but where the surface soil is in any way soft, or when they sink, they then act as a clog, although when tried by the dynamometer in ploughing bean stubble, which had been grubbed and soft after rain, the draught was only slightly greater than with the swing ploughs. In the ploughing of lea they are of great use, as the whole ridge can be ploughed with furrows exactly similar in size and shape, and they permit of the furrows being more thoroughly consolidated, and furrow-pressing dis-

pensed with. This plough is capable of turning as deep a furrow as those in common use, and the work which it makes, when held by inferior ploughmen, is equal to the work of average men with our own ploughs, besides that no labour has been expended on the mere appearance of being justly cut, finely turned, and smoothly closed. On the whole, I am not disappointed in Busby's plough, and have not the least doubt that, either in whole or in part, it will prove a valuable contribution from the sister country. I trust that, in arguing for a plough of a more perfect form, it will not be understood that I do not desiderate skill in the ploughmen; for the most skilful workman will always be able to make the most of his implement, of whatever description it is. But this I do regret, that so little has been done to instruct the ploughmen of the district in its construction and management. A smith, for instance, does the work of three or four farmers; one of them attends closely in the smith's, when his ploughs require repair; he knows their temper and what they need, and a few directions to the smith maintain the implements in good working trim. Another seldom attends to his ploughs; his men direct the smith, and yet fail to make good work. The master quarrels with the men, the men the smith, and recrimination goes on, which may, perhaps, end by the master telling the smith that if he gets the first-mentioned farmer's ploughs right he cares nothing for his. Such like scenes frequently occur: can nothing be done to spread among the young smiths and ploughmen more correct ideas regarding the make, repair, and working of the plough? A mighty fuss was made some time ago, and it has been again revived, of the benefits to be derived from teaching chemistry in country schools. Of the children attending them, it is not likely that more than one in twenty may be benefited much by it. But surely some information could be conveyed regarding the elementary principles of mechanics; and if this was the case, the young smiths, wrights, and ploughmen, as well as farmers' sons, would be in a more hopeful condition for acquiring a knowledge of the principles of the implements and tools with which they labour; and a simple treatise on the mode of construction and manner of use of the various ploughs now wrought would afford a ready reference when in difficulties, and would form a subject for study in the long winter evenings. Strange to say, however, that notwithstanding the flood of knowledge in the way of books with which the agricultural mind has been saturated, no one has thought of enlightening the humble, but deserving ploughmen, by publishing a cheap, short, practical treatise, on the principles, construction, and mode of using the plough. Such a work would form a far more suitable gift at ploughing matches than the whips and hammers we now hear of. To be complete, such a work should contain

directions for the management, guidance, and mode of yoking horses into the plough. Excellent ploughmen have said, that no young men will ever excel unless they try to learn, from those proficient in the art, the mode of tempering their ploughs, and unless they study in the evenings such plans as may enable them the next day to make superior work; and that the reason why so few excel is, that they will not give themselves up to sufficiently active thought, and the resolute determination to learn from the best workmen. With such a work at their command, there would then be no excuse for not knowing enough of the principles by which their implements are to be guided; and with a clear and distinct description of what constitutes good ploughing, and the rules by which it is to be judged, a superior kind of work would soon become visible, and fewer of those horse-murdering implements called ploughs, with their heads, socks, and coulters twisted into the land, and their beams turned away from it, would be seen.

The following letter was then read from Mr. Cunningham, late of Harelaw:—

"After the conversation I had with you last Wednesday, regarding the proper mode of ploughing, I shall endeavour to give you my practice for the last twenty years, previous to the year 1847. When I began to plough stubble in the autumn, I gave every man his measure of 10 inches on his ploughstaff to regulate his depth; the feather of the sock placed so as to cut the furrow level in the bottom; and it is my opinion that all stubble and fallow should be ploughed as level in the bottom of the furrow as possible; but when I came to plough lea for a seed furrow, I had a spare sock for every plough gently raised in the feather, to cut the furrow from half-an-inch, to one and a-half inches, thinned in the off side of the furrow, and by doing this you can plough the lea 8 inches wide, and 6 inches thick in the shoulder. This kind of ploughing puts 27 furrows into an 18 foot ridge, and by turning up the thick edge of the furrow, it enables the plough to put it perfectly close together, preventing the seed from falling to the bottom of the furrow and being covered too deep. This kind of ploughing takes less seed, less harrowing, and brairs sooner and more regularly, and ripens sooner and more regularly, and produces a fine sample of corn, and in my opinion gives more produce. About the beginning of the present century, I held my father's plough. The plough then used was called Small's plough, and with it, we could not put more than from 20 to 21 furrows in the ridge of 18 feet, and, in my opinion, it is the narrow ploughing that gives the best return. (In mentioning Mr. Small's name, I mean no disrespect, as he was amongst the first and greatest improvers of the plough; it was our own fault, perhaps, that we could not plough so narrow with his, not knowing how to set the irons.) I think the

more equally the seed is distributed over the surface of the land the better; for instance, where the land is thoroughly drained, and the seed intended to be put in with a drill, and when you do not intend to hoe, in place of the rows being ten inches, I would have them only five inches asunder: the more the grains can be separated the better, as they will have less contention with their neighbours about their food. I may be wrong, but I think it might be worth a trial on a small scale. Have we not seen ten or twelve cattle put into a court to winter on straw, and say half turnip; and have we not seen probably the one-half the strongest thrive well, and the other half make little or no improvement, from their being knocked about by their stronger neighbours, and deprived of their equal share of food? And so it is with wide ploughing and drilling—the ploughing about 10 inches, and the drilling from 10 to 12 inches wide. This brings too many of the seeds together, and the fibres struggle and ride over one another in search of food; and like the bullocks, the strongest shoots take the lead, and distress their weaker brethren, and make a very unequal sample of grain. I may mention, when holding my father's plough, and the land happened to be dirty, he made us plough it as thin as possible; he said that the dirt was easier taken out, when thin ploughed. However, when I came to plough on my own account, I ploughed the stubble dirty or not dirty, as deep as two horses could manage it; as I thought, if you did not go below the dirt at first, you could not do it so well afterwards. I am an advocate for a general plough, and not for stubble and lea ploughs, as I find it quite possible, with a well constructed plough, and a spare set of irons, to plough all kinds of land capable of being ploughed with two horses. I would at least strongly recommend two shares for every plough; one great advantage from having two shares is, when ploughing lea, you may have at the same time, a piece of turnip land to plough up, and the lea sock being too high set in the feather for ploughing that kind of land, put on your stubble sock, and all is right. There is much depending upon yoking the horses to the plough; the draught for the plough horses should be at least two inches higher than for the cart, the chains should be short, just room enough for the horses to step freely, without the swingle trees touching their heels; there should not be too much space between the master tree and muzzle. The reason is obvious, the farther you remove the horses from the plough the worse it is to draw. The back bands should be suspended over the horses' backs about six inches before the hookbones, and should carry a very little, just to show the chain a little bent to where they are attached. The best tempered horse should be put in the near side, their heads tied well back, say as far as the backband, and a rein should be used for each horse; however, the less use the

ploughman makes of them the better. The horses should be guided more by the word than by the rein. When the driver gets fairly acquainted with his horses he will have very little use for the reins, or even the land horse tied in, as he will be more ready than when tied in, particularly after the lea is ploughed. I have seen the horses so racked and tied together, that the one could not move one inch before the other. Such conduct should be put a stop to at once, or you will run a risk of having your horses completely spoiled. The canny way is the best. There is not one horse out of twenty, but will do more with kind usage than harsh treatment. To become a good ploughman, he must also be a good horseman; he must time them in everything, time them in their language; he must not speak too often to them, yet he must be heard; time them in their meat, and groom well. The more he and they get acquainted with one another the more work they will do with more ease to themselves and more advantage to their master.

Mr. WALKER, Kilpult, said that he was in favour of the forcing system in lea, as it was only for one crop that that sort of furrow was intended; and he thought that a much closer seam was obtained by having the furrow cut one inch thicker on the one side than the other, and the land was ploughed in a more workmanlike mode than in the manner spoken of by Mr. Melvin. He thought that Mr. Allan's experiment referred to, supported the high shouldered system of ploughing.

Mr. DAVIDSON, Townhead, agreed with much contained in Mr. Melvin's remarks, and also with most of Mr. Cunningham's; but he also disagreed with part of both. He was of opinion that of the three ploughs—viz., Small's or the East-Lothian, Cunningham's or the Mid-Lothian, Wilkie's or the Lanarkshire—that each was the best for the several districts; and he maintained that Cunningham's was decidedly the most efficient for this district. He also was in favour of a high-shouldered furrow for lea, although he by no means advocated the extreme form of furrow. In the ploughing of stubble, he found Cunningham's plough quite efficient, and he was at present turning over a furrow ten inches deep with it. The Small's plough he thought was a very inferior implement for this quarter, although it might be best in East-Lothian; if all land was dry, loose, and in high cultivation, such a plough might do, and then the crop could be drilled in rows, eight or nine inches apart. He was satisfied that ploughing matches, although attended with disadvantages, were on the whole of great use, as they had encouraged a spirit of emulation among the men, and had improved the general style of work in the district; and he believed that such comparative trials as had been made by Mr. Allan ought to be prosecuted, and the results

ascertained from the plain and high-shouldered systems.

Mr. ALLAN, Clifton, said that the results of the trial made by him had the effect of convincing his ploughmen that the idea which existed, viz., that between the best description of ploughing, and that of a good strong furrow, was a mistake. And although he did not maintain that such a difference was found constantly, yet he considered that far too little attention had been paid to the encouragement of the best kind of work. He certainly agreed, if the furrows could be properly closed without forcing, that it was decidedly preferable to do without it; and from what he had seen of the working of Busby's plough, he would be very glad to have all his lea turned over in such a manner, as it did its work well; for although the shoulder was not so high, the furrows were all alike well closed, and so compactly placed together, that you could tread upon them without displacing them in the least. He was in favour of further comparative trials being made for the purpose of testing the merits of the various systems, at the Society's ensuing ploughing match.

Mr. M'LAGAN expressed a hope that something practical would result from this evening's discussion, for there could not have been a more important subject brought before the meeting than ploughing, which is the foundation of all the farmer's operations in the field. He suggested, therefore, that as the annual ploughing match of the Association would soon be held in the district, a committee should be appointed to make observations on the different kinds of ploughs brought forward for competition on the day of the match, &c.; and also to superintend the weighing of the crop grown on different ridges, which had been ploughed by ploughs differing in construction, and by men considered by the judges of the day to possess different degrees of excellence in ploughing. He was quite aware that the office of the committee would be no sinecure, as many things would have to be taken into account, such as the quality of the soil on the various ridges, before they can come to any useful decision. He agreed generally with the remarks made by Mr. Melvin as to adopting that kind of plough which would cut, turn over, and close a good rectangular furrow. It admits of both mathematical demonstration and arithmetical calculation, that more soil can be turned over and exposed to the air by a rectangular furrow, nine inches in width and six inches in depth, than by any other

furrow. The plough which will raise, turn over, and expose to the air, the greatest amount of soil, with the least expense of labour, is the one which we should adopt for all practical purposes. No doubt we cannot always adhere rigidly to the size and form of furrow mentioned above, in practice; hence he agreed with Mr. Davidson, that in the thin clays of this district, the best plough for a lea furrow is the Cunningham or Currie plough. And no little credit is due to Mr. Cunningham, for the sagacity and perseverance which he has shown in adapting his implement to the soil of his farm, and that of his neighbours. What we want now is that the same sagacity and perseverance should be manifested by some other person in adapting the plough to the altered circumstances of agriculture. All these lands are now being improved, changed in many of their properties, and subjected to a management different altogether from what they were formerly, and requiring, therefore, a different class of implements for working them. For instance, while the Currie plough did well enough in turning over and pressing a shouldered furrow on lea, in thin clay soils, in their undrained state, it is found quite insufficient to give a good strong stubble, or cross furrow, in the green crop break, after the land is drained, without great oppression to the horses. Now that the growth of green crops is extended, there is the greater need of a plough, which will enable us to work the land thoroughly, with as little expense of horse-flesh as possible. And this necessity is the more urgent; for, as Mr. Melvin has well said, from the extended use of the grubber at present, we require to go with the plough below the grubber, which has the effect of firming the land. He had often remarked, that in East-Lothian they were enabled to plough much deeper than we do, with more apparent ease to the horses; though, from what he had seen lately, he was inclined to think that the mouldboard of the East-Lothian plough was too short to enable it to press the furrow sufficiently, when it was brought to plough stiff lea.

The CHAIRMAN stated, that into the subject of discussion he would not enter, but that one remark which fell from Mr. Melvin, regarding the education of the ploughmen, met with his approval. He thought the higher the standard of that education they received was, the better for their employers; and he called on the tenantry to assist in this, and also to apply to their landlords for better houses for them.

## AGRICULTURAL BIOGRAPHY.

*(Continued from page 113.)*

## CXXVIII.—DOSSIE, 1767.

Robert Dossie, Esq., wrote "Memoirs of agriculture, and other economical arts;" London, 1767, 3 vols., 8vo., price 15s. The author seems to have been a scientific person, and published several works relating to chemistry. The book of memoirs is dedicated to the King, and the contents relate wholly to the rewards and premiums given by societies to the inventors of any design, or a success in manufacture. Much discussion was made on the comparative merits of the broadcast and drill-sowing of grains and root crops; the turnip-rooted cabbage and burnet were introduced, and coleseed was extensively used. The culture of turnips, parsnips, and beans, is extensively agitated, and the drilling of lucerne. Ploughs and carts are brought forward, and the merits settled. The information is altogether contained in the form of letters, which do not bespeak the learned arrangement that is necessary. But much useful matter is found in the three volumes.

## CXXIX.—WESTON, 1767.

Richard Weston, Esq., of Kensington Gore, near London, was a literary person, but his chief attention was turned to agriculture and gardening. He wrote "Tracts on agriculture and gardening, with a chronological catalogue of English authors on agriculture and gardening;" London, 1767, 8vo. The notices of agriculture contain a list of manures, among which no new substance is mentioned. Various methods of feeding and fattening of fowls, geese, ducks, and turkeys; a method of suckling calves; and the improvement of barren lands by trees.

The catalogue of authors is very valuable, and affords a chief authority in the compilation of this biography. It extends to the year 1772. Weston published some works on gardening and planting, which are esteemed. No memorials remain of his individual station in society, or professional life.

## CXXX.—HUNTER, 1769.

Alexander Hunter, M.D., F.R.S., London and Edinburgh, was born at Edinburgh, in 1738; practised as a physician at Gainsborough, at Beverley, and finally at York, where he died in 1809. He wrote some professional tracts, and republished Evelyn's "Silva and Terra." He wrote "Outlines of agriculture, addressed to Sir John Sinclair, Bart., President of the Board of Agriculture;" York, 1795, 8vo., 5s. "A new me-

thod of raising wheat for a series of years on the same land;" York, 1796, 4to., 6s. "Georgical essays, in which the food of plants is particularly considered, several new composts recommended, and other important articles of husbandry explained upon the principles of vegetation by a society instituted in the north of England, for the improvement of agriculture;" London, 1769, 4 volumes, octavo.

"The method of raising wheat continuously on the same land" is not found in the libraries of the British Museum, and the ignorance remains how it was proposed to effect this yet to be attained purpose. "The outlines of agriculture" consist of 38 octavo pages, which are bound in a volume of tracts. The matter relates entirely to the principles of life both in the animal and vegetable world, and contains much scientific truth.

"The georgical essays" form two small octavo volumes, being four divisions bound into two books. The contents are:—

## VOL. I.

- Essay 1. On the rise and progress of agriculture.  
 2. On the nourishment of vegetables.  
 3. On a rich and cheap compost.  
 4. On vegetation, and the analogy between plants and animals.  
 5. On steeps.  
 6. On the roots of wheat.  
 7. On vegetation, and the motion of the sap.  
 8. On the oil compost.  
 9. On a new method of cultivating weak arable lands.

## VOL. II.

- Essay 1. On the study of nature.  
 2. On the rise and ascent of vapours,  
 3. On the Siberian barley.  
 4. On potatoes.  
 5. On turnips.  
 6. On a new kind of manure.  
 7. On carrots, and their use in fattening hogs.  
 8. On the time of sowing.  
 9. On the oil compost.

## VOL. III.

- Essay 1. On the connection between botany and agriculture.  
 2. On the nature and properties of marl.  
 3. On drill sowing.  
 4. On manures and their operation.  
 5. On top-dressings.  
 6. On the different qualities of rain which fall at different heights over the same spot of ground.

## VOL. IV.

- Essay 1. On the juice of carrots.  
 2. On the culture of potatoes.  
 3. On the analogy between plants and animals.  
 4. On experiments.  
 5. On the sexes of plants.  
 6. On a cheap and expeditious method of draining land.  
 7. On the orchis root.

These essays have ever engaged a very well deserved reputation, both with practical and scientific men. The subjects are concisely treated, and the language is neat and appropriate. Hunter with his essays, and Randall with his *Semi-Virgilian husbandry*, constitute a very large ascent in the progress of enlightened agriculture. The drill-husbandry was at that time coming into operation, and was warmly advocated by both writers, and even not unfairly understood by them. Every kind of learning was rapidly moving forward, and agriculture did not escape the propulsion.

## CXXXI.—PETERS, 1770.

Matthew Peters wrote "The national or rational farmer, a treatise on agriculture and tillage;" London, 1770, 8vo., price 2s. 6d. "Winter Riches, or a miscellany of rudiments, directions, and observations necessary for the laborious farmer, on a new vegetable system of agriculture;" London, 1771, 8vo., price 3s. 6d. Weston ascribes another book to Peters, called "De re rustica, or the repository;" 2 vols., price 12s.

None of the above-mentioned works are found in the libraries of the British Museum; but our research discovered "Agriculture, or the good husbandman;" by Matthew Peters, author of the "Rational farmer," and of "Winter riches."

This work has escaped the notice of all the lists of books and writers in the *Bibliotheca Britannica*, Weston and Loudon. The other writings of Peters' are the same in every list; only Weston gives one more than the other catalogues. The "Agriculture" is a thin octavo volume, of 195 pages, and is dedicated to the Duke of Leinster, as the author wrote in, or belonged, to Ireland. It treats politics, commercial subjects, enclosing of common grounds, heaths, chases, and forests; culture of potatoes, wheat, and barley; manures, natural and artificial; lucern, sainfoin, blights; depopulation and monopolizing; tillage and pasture; kinds of wheats and barleys. The matter is very heterogeneous and mixedly treated; but the author had possessed a large store of sound information on all practical matters. He is loud in the praise of turnips, and of the drill-culture. He was familiar with the potato, which had a warm approbation. Frequent references are made

to the other works.—"Rational farmer," and "Winter riches," which causes a regret that they are not found. Our opinion places this author among the best writers of the time.

## CXXXII.—PENNINGTON, 1770.

W. Pennington, wrote "Reflections on the various advantages resulting from the draining, enclosing, and allotting of large commons, and common fields;" London, 1770, 8vo., 1s. The essay occupies 77 octavo pages, and argues very strongly the great advantages of enclosing all lands that are capable of cultivation, both for the purposes of tillage and pasture. It is a very useful tract on the subject.

## CXXXIII.—COMBER, 1771.

Thomas Comber, L.L.D., rector of Buckworth and Morborne, in the county of Huntingdon, died 1778, wrote "Real improvements in agriculture," (on the principles of A. Young, Esq.); recommended to accompany improvements of the rents, in a letter to the aldermen of Huntingdon; to which is added a letter to Dr. Hunter, Physician, in York, concerning the rickets in sheep; London, 1771, 8vo., price 1s. 6d. The book contains 83 octavo pages, in which the author touches many points of practice, and suggests better modes of proceeding. He thinks oxen are vastly preferable to horses for farm work, as the animals live on coarser food, and the ruminant process makes any food of whatever quality to be good nutrition. This book added little to agricultural progression.

## CXXXIV.—MILLAR, 1772.

Francis Millar wrote "The husbandman's directory;" 1772, 12mo., price 2s. The *Bibliotheca Britannica* makes this statement, but the author or the book are not noticed in any other list of authors, or books on agricultural subjects. The names are placed here on the above authority.

## CXXXV.—JACOB, 1773.

Joseph Jacob wrote "Observations on the structure and draught of wheel carriages;" London, 1773, 4to., price 6s. "Animadversions on the use of broad wheels, and the preservation of the public roads;" London, 1774, 4to., price 1s. 6d. Only the first-mentioned book is found in the libraries of the British Museum; it is a thin quarto of 99 pages, in 4 parts—of the draught of carriages in general; of the structure and draught of wheel carriages in particular; of the construction of various carriages for different purposes; of some improvements that are or might be made in the structure of wheel carriages. Illustrations are given, but no very particularly valuable demonstration is contained in the book.

## CXXXVI.—VARLS, 1774.

C. Varls, Esq., wrote "A new system of husbandry;" London, 1774, 3 vols., 8vo., price 15s. This is the fourth edition, the three former having been chiefly sold by subscription, and by the author and his agents. "Schemes offered to the perusal and consideration of the legislature, freeholders, and the public in general;" London 1775, 8vo., price 3s. A mass of very sound and useful information is contained in the "System of husbandry," but is most confusedly arranged and very mixedly detailed. Potatoes and turnips were now well known, drilled, and the latter consumed on the ground. On manures nothing new is added; but the directions for the application of the substances are very enlightened and soundly practical. The author had possessed large acquirements on the matters of husbandry, but lost much of the value from the want of a systematic treatment.

## CXXXVII.—KENT, 1774.

Nathaniel Kent, of Fulham, Middlesex, wrote "Hints to gentlemen of landed property;" London, 1774, 8vo., price 5s. "General view of the agriculture of the county of Norfolk, with observations on the means of its improvement; drawn up for the Board of Agriculture and internal improvement, with additional remarks from several respectable gentlemen and farmers, &c." Norwich, 1796, 8vo, price 5s. "Accounts of the improvements made on the farm in the Great Park of His Majesty the King, at Windsor." Nicholson's Journal, III., 428, 1799.

The Norfolk survey has always been reckoned one of the best that issued from the Board of Agriculture, being very comprehensive, and justly and acutely remarked. The hints on landed property form a book of 286 octavo pages, and discusses in a very neat manner the general routine of farming as then performed, with many valuable suggestions of future practice. The author puts a heavy value on labourers' cottages, and gives designs of dwellings that have not been exceeded in the present times. His hints to landed proprietors are valuable, to grant equitable leases of land, in order that the soil may become useful to others as well as to themselves, and diffuse as much good to society as possible. On the subject of game, the author advises lenity, forbearance, and confidence; the farmers are the best guardians of it, and will do the duty much better than any gamekeeper. This author must have been a very enlightened person.

## CXXXVIII.—RINGSTED, 1774.

Josiah Ringsted, Esq. wrote "The cattle keepers' assistant; or genuine directions for country gentlemen, sportsmen, farmers, graziers, &c.," London, 1774, 8vo., 1s. 6d. "The Farmer," comprehending the most interesting objects, beneficial practices

in the culture of wheat, rye, barley, oats, buckwheat, &c.; London, 1796, 8vo., price 2s. 6d. These names are not found in the national library: our authority comes from the Bibliotheca Britannica alone.

## CXXXIX.—ANDERSON, 1775.

James Anderson, LL.D., was born at Hermiston, a village near Edinburgh, in 1739, of very respectable parents, where his ancestors had long held a farm in that locality. His education was chiefly the result of his own exertions. He lost his father when he was only fifteen years old, and he managed the farm at that early time of life. After making every study within his reach, he removed to Aberdeen shire, where for twenty years he managed a hitherto uncultivated tract of ground in 1300 acres, which he subsequently let for a life annuity. He removed to Edinburgh, projected the North British Fisheries, and was employed by government to survey the coast of Scotland. He commenced "The Bee" a periodical that was ably supported, but fell by reason of political intermeddlings. The author removed to London in 1797, and led a very domesticated life, chiefly employed in writing and gardening, till he died in 1808.

The works of Anderson are many—the agricultural ones are as follow: "Essays relating to agriculture and rural affairs;" Edinburgh, 1775, 8vo.; 1777, 8vo.; London, 1776, 3 vols., 8vo.; London, 1800, 3 vols., 8vo. "Miscellaneous thoughts on planting and training timber trees, by Agricola;" Edinburgh, 1777, 8vo. "An enquiry into the causes that have hitherto retarded the advancement of agriculture in Europe, with hints for removing the circumstances that have chiefly obstructed its progress;" Edinburgh, 1779, 4to., price 3s. "An account of the present state of the Hebrides, and Western coasts of Scotland, with hints for encouraging the fisheries, and promoting other improvements in these countries; being the substance of a report to the Lords of the Treasury;" Edinburgh, 1785, 8vo., illustrated with a geographical map. "A practical treatise on peat moss, considered in its natural state, fitted for affording fuel, or as susceptible of being converted into mould capable of yielding abundant crops of useful produce, with full directions for converting and cultivating it as a soil;" Edinburgh, 1794, 8vo., price 4s. "A general view of the agricultural and rural economy of the county of Aberdeen, with observations on the means of its improvement; chiefly drawn up for the Board of Agriculture," in two parts; Edinburgh, 1794, 8vo. "A practical treatise on draining bogs and swampy grounds with cursory remarks on the originality of Elkington's mode of draining;" London, 1798, 8vo., price 6s. "Recreations in agriculture, natural history, arts, and mis-

cellaneous literature;" London 1799-1802, 6 vols., 8vo, price £3 7s. "A description of a patent hot-house, which operates chiefly by the heat of the sun, and other subjects, without the aid of flues, or tan bark, or steam, for the purpose of heating it;" London, 1804, 12mo., price 4s. 6d.

The Recreations in agriculture and arts occupy six stout octavo volumes, to which the introduction is a most rationally systematic arrangement of the several objects that must engage the agricultural enquiry; as vegetation in general, soils, impoverishing matters, manures, obstructions to agriculture, operations by art, by nature, extirpation of weeds, inclosures, fences, implements, disquisitions on vegetables, on animals, cultivation of crops, orchards, fruits, timber trees, live stock, considerations on the different kinds, on the general management of an arable farm, of a grass farm, of an unimproved farm, general disquisitions on the management of land, on farm buildings, on fuel, on accidents, diseases of crops, of animals, on the weather, on the obstacles to agriculture, its claim as an object of taste and recreation.

The varieties of sheep have a long discussion, and also Gothic architecture, with the various kinds of cattle and the dairy. The construction of carts is not forgotten, with the waggon, and the harness for the farm horse. The culture of potatoes, and the best kinds of them, are much required, and various experiments recorded. A most excellent article appears in vol. 6, on the management of clay soils. Tithes, and the migration of the herring, are largely considered. In these volumes, scientific, practical, and literary matters are most agreeably blended, and form a truly rational "recreation."

"The survey of the county of Aberdeen" is a volume of 181 octavo pages, describing the county in its rivers, mountains, soil, agriculture, and manufactures. The author everywhere exhibits a correct knowledge, along with temperate observations.

"The enquiry of obstacles to agriculture" occupies 72 quarto pages; attributing the chief impediment to be the want of attention to the particular subject, and to the want of a Geographical Society with a monthly journal. The arguments are very just, and cogently applied.

"The essay on peat moss" is an octavo volume of 233 octavo pages, describing moss as fuel, and when converted into mould. The reasoning is ingenious; but all disquisitions on moss, where it exists in the purest condition, and in knowing that the substance is useless for cultivation, and the climates under which mosses lie, render wholly abortive every attempt of alteration. The case is very different with mossy earths, or moorish soils, which freely admit cultivation.

"The account of the Hebrides, or the western islands of Scotland," forms a thick volume of 452 octavo pages, wherein are contained much sound sense, and very plausible suggestions. But, as in the case of peat moss, the natural circumstances of soil and climate will baffle all the exertions of human intellect; and recent trials have proved the inefficacy of the most benevolent intentions, and the power of expenditure. The uprise of such countries must be slow, very gradual, and in a strict ratio with circumstances.

"The treatise on draining bogs" fills 308 octavo pages, showing very much enlightened judgment on the part of the author, though he might at once have seen the fallacy of Mr. Elkington's mode of draining, except in some few peculiar cases.

The writings of James Anderson everywhere exhibit a mind of no common calibre, that was able to enjoy the refinements of science without allowing its deductions to overheat the fancy and betray the judgment, leading astray the intellect from the sober maxims of practical truth. He enjoyed the beaming lights of science, but never in one instance allowed its dazzle to dim the vision of operative knowledge. A singular exception was formed by his character on this point; either the scientific man leaves the roads of practice, and loses himself among untrodden pathways; or the practitioner will walk only upon the old beaten tracks, and finds no new roads that lead to eminence and advantage. Our author did neither, but choosing and being able to grasp the happy medium, he gratified himself, and enlightened the world with lucubrations that comprehended both kinds of knowledge, and thus explored a fountain that flows an everlasting issue of benefit to the human race.

Anderson's views of commercial regulations and social policy were most liberal and enlightened, and would have stamped his name with excellence in any age or nation which had given him birth. His ideas on these points form an era of very great advancement in agricultural progress.

#### CXL.—DONALDSON, 1775.

William Donaldson, Esq., acted for some time as secretary to the government of Jamaica, and wrote "Agriculture considered as a moral and political duty, in a series of letters inscribed to his Majesty;" 1775, 8vo., price 3s. 6d. The book is a thin octavo of 202 pages, and places agriculture as the first temporal idea that possessed the human mind, and that the study of it was prosecuted in the university of nature. The earth was the first legible volume which was unfolded by nature for the exercise of the human mind, from which have sprung all the blessings of this world. The author reprobates large farms, either arable or graz-



ing, and discourages the enclosing of commons; dreads giving farmers any political influence, and advises a legislative enactment that oxen perform all the labours of cultivation, and that horses be abandoned. The letters are wholly retrospective and argumentative, and bring forward no new plan of comprehension, or make any suggestion of importance.

CXLI.—BARRON, 1775.

William Barron, F.R.S.E., was Professor of Logic and Belles Letters, in the university of St. Andrew's, Scotland. He wrote "Essays on the mechanical principles of the plough;" Edinburgh, 1775, 8vo. This book is not found in the libraries of the British Museum, and the name is here entered on the authority of the Bibliotheca Britannica, and Loudon's list of authors. The logical works of the author are found in the Museum.

CXLII.—HARRISON, 1775.

Gustavus Harrison, Esq., wrote "Agriculture delineated, or the farmer's complete guide;" being a treatise on lands in general; London, 1775, 8vo., price 5s. The name of the author nor the book is found in the libraries of the British Museum, and the use of them in this place rests on the authority of the Bibliotheca Britannica, and Loudon's list of authors. Weston has ceased to aid our enquiry, as his catalogue ended in 1772.

CXLIII.—HOME, 1775.

Henry Home, Lord Kames, among the Judicial Lords of Scotland, an eminent lawyer, philosopher, and critic, was born at Kames, in Berwickshire, 1696. He was descended from an ancient and honourable family, the ancestors of which had sprung from the family of the Earls of Home. Our author was early bred to the law, and had little or no patrimony on which to depend. His activity, industry, and exertions were called into action at an early period of life, to which circumstance he ever afterwards attributed the eminence which he attained. His initiatory education was derived from a domestic tutor.

Home's ambition quickly led him to look above the inferior station of his profession, and he studied hard to qualify himself for the highest standing. His pursuit embraced the natural sciences, logic, ethics, and metaphysics, of which last branch he became very proficient. He was called to the bar in 1724, but not shining in oratory, he did not engage much practice as a pleader. The first specimens from his pen quickly procured a reputation, which enlarged his practice and stamped his name as a profound and scientific lawyer. He enjoyed the friendship, and held the correspondence of the leading characters of the day. In 1752, he was appointed a Lord of Justice, and took the title of his

native place, and in 1763 he was one of the judges of the Supreme Criminal Tribunal, in Scotland. In town he was an active and industrious lawyer and judge; in the country he was a judicious and scientific farmer on the paternal estate, which came into his hands in a very ruined and unproductive condition. He wrote and published largely.

In 1766 he received an inheritance by his wife, in the estate of Blair Drummond, which furnished him with ample means of displaying his taste and skill in devising and executing improvements on lands and pleasure grounds. His ideas were that "in points of morality, the people upon landed estates are trusted by Providence to the owner's care, and that the proprietor is accountable for the management of them to the Great God, who is the creator of both." He published an essay on flax husbandry, and took an active part in all country undertakings. In pursuance of the patriotic wish to improve the agriculture of his country, he published, in 1766, "The gentleman farmer," written when he was eighty years of age. His physical strength now declined, but the mental powers showed no sensible decay; he gradually sunk to his death in 1782, in the eighty-seventh year of his age.

The literary merits of Lord Kames have enjoyed a large approbation, though not without the usual share of controversy. His agricultural work is an octavo volume of 438 pages, in two parts; the first part, in 14 chapters, treating of—

CHAP. I. Instruments of husbandry: 1. The plough. 2. The brake or drag-harrow. 3. The harrow. 4. The roller. 5. The fanner.

CHAP. II. Farm cattle and carriages: 1. Farm-horses. 2. Farm oxen. 3. Breeding horses and horned cattle. 4. Wheel-carriages.

CHAP. III. Farm offices.

CHAP. IV. Preparing land for cropping: 1. Obstructions to cropping. 2. Bringing into culture barren lands. 3. Forming ridges. 4. Clearing ground of weeds.

CHAP. V. Culture of plants for food: Sect. 1. Plants cultivated for fruit.—1. Wheat and rye; 2. Oats; 3. Barley; 4. Beans; 5. Peas. Sect. 2. Plants cultivated for roots—1. Turnips; 2. Potatoes; 3. Carrots and parsnips. Sect. 3. Plants cultivated for leaves.

CHAP. VI. Culture of grass.

CHAP. VII. Rotation of crops.

CHAP. VIII. Reaping hay and corn crops, and storing them up for use.

CHAP. IX. Feeding farm cattle: 1. Green food. 2. Dry food. 3. Feeding for the butcher. 4. The store cattle. 5. Rules for buying and selling cattle and corn.

CHAP. X. Culture of other plants of a farm:

Sect. 1. Forest trees—1. Trees from seed; 2. Cuttings, layers, and suckers; 3. Soil proper for trees; 4. Climate; 5. Time of planting; 6. Manner of planting; 7. Pruning; 8. Wood proper for the instruments of husbandry. Sect. 2. Flax. Sect. 3. Hops.

CHAP. XI. Manures.

CHAP. XII. Fences.

CHAP. XIII. The proper size of a farm, and the useful accommodations it ought to have.

CHAP. XIV. What a corn farm ought to yield in rent.

#### PART II.

CHAP. I. Preliminary observations. 1. Elective attraction and repulsion. 2. Faculty of plants in accommodation. 3. Change of food and of species.

CHAP. II. Food of plants and fertility of soil.

CHAP. III. Means of fertilizing soils. 1. Ploughing. 2. Manures.

#### APPENDIX.

Art. 1. Imperfections of Scotch farming. 2. A board for improving agriculture. 3. General lease for a corn farm. 4. Plants and animals compared. 5. Propagation of plants.

Lord Kames had attained a practical knowledge of agriculture very much beyond the acquisition which his social position could be expected to afford. He advocates the lease of land to be not under twenty years in duration; and as kings are fettered in the exercise of power, so farmers must be confined in their use of the soil; but in an easy way, not compulsory, but hindering to do some few things of evident damage to the land, of easy compliance on the part of the farmer, and to his own

individual advantage. His ideas on this vital point are most enlightened and dignified. On manures the notice is short, being confined to farm-yard dung, lime, and marls. He avoids any disquisition on the nature of lime, or its action on the soil; but advises it be used in a hot pulverized condition, and intimately mixed with the land in a finely comminuted state. The notice of farm buildings is short, and offers little to be told: fences are similarly treated. The plough and harrow of Scotland are delineated in nearly the same form as now used; a chain is fixed below the beam, forming the chain ploughs of that country, which are yet adopted. The author argues strongly in favour of oxen over horses in farm work, and wondered at the blindness of men who were unable to see the advantage, and that horses were daily superseding the ox. The reader wonders more that his largely comprehensive mind and strong sagacity of judgment were unable to see that nature, in the muscular formation of the two animals, has incontestably decided the preference of the horse for farming purposes, and that the growing adoption of the animal over the ox proceeded from the most convincing proofs of superiority. Such is the force of pre-conceived opinions over the strongest exertions of human intellect: the author saw the advantage of leases, but failed with respect of the quick horse and the sluggish ox. The book, however, possesses much merit, and shows a large progress being made on agricultural subjects. In our opinion, Lord Kames was behind James Anderson both in the views of social policy, and regarding the connection of agriculture with other branches of physical learning.

(To be continued.)

### ON SOME OF THE DISEASES OF CATTLE, THEIR PECULIARITIES, AND TREATMENT.

At a monthly sectional meeting of the Royal Dublin Society, Dr. Toler read the following paper:—

#### DISEASES OF CATTLE.

Mr. Chairman and Gentlemen—Having for some years closely observed the habits and diseases of cattle, particularly during the prevalence of different diseases, I intend laying before this Society the result of my experience, in the hope that it may prove interesting, and perhaps useful, to some gentlemen present, who are themselves in the possession of valuable stock.

First, then, I shall describe two cases of death in valuable cows, from rare and uncommon causes; secondly, I shall make some observations upon the

mouth and foot distemper; thirdly, the pleuro-pneumonia, or chest disease, which proved so fatal; fourthly, a peculiar affection, resembling the pleuropneumonic disease in many parts, which I believe has been frequently mistaken for it; and lastly, I shall glance at the management of young calves, with an account of their diseases and treatment.

I bought a fine four-year-old cow in the spring of the year, in tolerable condition, for the purpose of fattening her; she appeared quite healthy, but thinner than usual. I placed her upon good pasture, and watched the progress of her improvement. After a month, not finding her improving, I changed her to my best pasture, but found she would not

put up flesh; her hide was quite loose and sleek; she ruminated but only partially, and much less than other cows; her evacuations were quite natural; her lungs and heart sound: so that her continued state of leanness was quite a mystery to me. One day the herd brought her home, and said she was ill; she had ceased to ruminate, but there was no other indication of sickness. After a short time the abdomen became enormously swollen, and medicine given by the mouth returned back again; injections freed the bowels, but still the swollen state of the stomach continued until she died. On opening her stomach, I found the upper orifice completely occluded by a round, flat stone, about one inch in circumference; a groove had been formed for about three-fourths of its circumference in the lining membrane of the œsophagus or food passage, in a slanting direction and I imagine it had been there for a long time, but from some cause it passed downwards, shutting up the orifice of the stomach like a valve. The other case was much similar to the last in its symptoms; the animal continued thin for some time, when she ceased ruminating, bowels became confined, and she appeared to have some stomach disease; purgatives acted, and the bowels were brought round, but still she continued thin, her skin remaining sleek and not hide-bound, when one morning I was informed she was dead. On opening her stomach I found the heel of a *brogue* imbedded in matter, with a long nail passing upwards through the stomach and midriff; I traced it up into the substance of the heart, where it had entered about half an inch, its transit being covered with purulent matter.

It may be said, these cases must be inevitably fatal; and what is the use of detailing them? Now I think there is very great utility in doing so; for this reason, that I think by minute examination of symptoms similar ones might be detected and distinguished from disease, and the possessor might be enabled to send her to the shambles in time, so as to turn her to some advantage. There was one thing remarkable in both of them, that the skin remained sleek and loose. Now, in all diseases of cattle, the skin becomes roughened, or what the common people call "the hair staring," and the animal becomes hide-bound. In these cases rumination was performed, and the functions of the bowels and urinary organs were healthy up to a short period before death. In both cases the continued leanness was the only remarkable symptom.

Secondly, the epizootic, which has for centuries visited this country periodically, or mouth disease, generally attacks cattle in the spring of the year, after a cold and severe easterly wind. The first time I noticed it, I was surprised to find a number of my heifers, which I was feeding on straw, moping

about the yard, shaking their heads, as if wishing to get rid of something in their mouth, the saliva flowing away, their eyes red and watery, and on attempting to take their food, dropping it from their mouths untouched. In a few days, I found they become quite tender on the feet; and on examination, I found a series of small ulcers breaking out between the hoof and hair. On carefully opening their mouths, I found their gums, roof of the mouth, and palate, denuded in spots of mucous membrane, and the tongue generally covered with blisters; if things were permitted to go on, the animal soon became feverish, and wasted away; so that, before the disease exhausted itself, the animal was reduced to the greatest degree of debility, and put back a long time in her fattening. I considered it as a local disease, and concluded, if I cut short the disease at once, before fever set in, that the animal would be quickly restored to health. I had the animal carefully held, and the tongue cautiously pulled out of the mouth, and then by means of a piece of sponge tied on a stick I carefully applied a strong solution of sulphate of zinc and burnt alum to the abraded surfaces, two or three times daily; it succeeded beyond my most sanguine expectations, and the animals were feeding on straw in a few hours after, and no fever ensued. If the feet were ulcerated, I applied an ointment of sulphate zinc and copper, with tar and lard, which rapidly healed them. Great caution must be used in holding the tongue, as I have known more than one case, where it was laid hold of with violence, and pulled out, when the entire skin of the tongue came away in the hand, leaving the tongue raw and uncovered. One case proved fatal from this cause. It is very remarkable, that about the same time from fifteen to twenty patients used to come to me daily, at my dispensary, with stomatitis, or a disease precisely similar to that I have described in the mouths of cattle. And, when it had existed for a few days, a considerable degree of irritative fever accompanied it, the patients not having slept for nights, with the burning sensation of the mouth. It was easily cured by the application of a strong solution of caustic two or three times. I think this proves that the disease is attributable to a vitiated state of the atmosphere.

Thirdly:—Now sir, I shall describe a much more formidable disease, and one which has caused the ruin of many graziers; I allude to the chest disease, or pleuro-pneumonia, which has been known for centuries in this country. You walk out among your stock, and you find a heifer isolated from the rest; she does not feed, her head is drooped and so is her tail. When you go up to her you find her eye is languid, she breathes hurriedly, and more by the abdominal than pectoral muscles; she

has a short cough or grunt, and this symptom I look upon as characteristic of the disease, as I never saw a case of pleuro-pneumonia, where the animal did not make a noise between a grunt and a cough; she is hide-bound, with the hair staring; she slowly moves away from you, attempts to eat, but cuts no grass; she does not ruminate; if you percuss or strike her ribs, you will find the sound clear, generally on the right side; but when you strike the left, you find it quite dull over the region of the heart, up two-thirds of the ribs, and then towards the back bone; you will, perhaps, find respiration natural; on placing your ear over this dull region you will detect a crackling sound. In most cases the disease rapidly runs its course; the heart becomes involved, and one or both lungs become a series of abscesses; the animal will not feed, she breathes now entirely by the abdominal muscles, the ribs remaining almost fixed; she protrudes her tongue, which becomes swollen, and before death, throws out the broken-up structure of the lung with quantities of matter. In all the cases I have examined I have found the heart solidified and of a yellow colour, and having its bag, or investing membrane, closely adhering to it, and that I look upon as the principal reason the disease proves so fatal. In one heifer I treated from the commencement, I at once detected the disease; I bled and blistered her, but the second day I found the heart became enlarged; every second day, for a fortnight, I took a small quantity of blood from her, I gave her mercury, and each time I checked the disease; but after three weeks she died, and I found the heart solid and yellow, adhering to its investing membrane, and the left lung completely destroyed by abscesses, the right being perfectly sound. I believe, in many cases, the disease may be cured by small doses of tartar emetic and turpentine (half a wine-glass full), three times a day, in a half-a-pint of cold water, blistering, and a seton promptly passed through the dewlap. I came to the conclusion, after treating a few cases, never to do so again, but the moment they become affected to send them away; for two reasons:—first because they are so long recovering, and afterwards fattening, that they will not remunerate you for their keep; and secondly, they are sure to infect your entire stock, if they are placed among them. I have known, where many cases were permitted to run their course or treated on the land, that pasture to produce the disease in cattle placed upon it for two or three years afterwards. There can be no doubt of its being highly infectious. A friend of mine had a bull; he took the disease, and by energetic means recovered. In about a month after he was recovered, seven heifers broke into the field where he was, and before the herd could drive them away, he had risen on three of them, four remaining uncovered by

him. In a few days the three heifers he had risen upon took the disease, and died of it, the other four remaining quite healthy. Now, I think that establishes the infectious nature of the disease, and the urgent necessity of parting the animal affected at once, the first loss being the least.

Fourthly:—A gentleman having heard that his neighbour had some cases of distemper, goes out after dinner, of a summer's evening, accompanied by his herd, to inspect his stock. On going into the field he perceives, perhaps, one of his best heifers isolated from the rest, standing with head and tail drooped, her tongue perhaps a little protruded, the saliva running from her mouth, her eye wild, (and this is the peculiar symptom), a short frequent cough, respiration rapid, and in every way the animal appears in great distress. If he be a generous man, he will tell his herd to take her home, kill her, and divide her among the poor of the neighbourhood; or, if he cannot afford that, or imagines he cannot, which amounts to the same thing, he will tell him to take her off to the neighbouring town, in the cool of the night, and sell her for what he can get; or he may imagine himself a great doctor, and he will have her driven home, have her bled and blistered on both sides a roll of thread as thick as three fingers passed through her dewlap, have her purged and clystered. In the morning, when he comes out, he finds her very lank and exhausted; he drives her out, she drinks greedily, and voraciously devours the grass. The herd cries out—"Your honour's a great doctor entirely; you have cured the beast, but sure you had the learning for it." Well, the animal had no distemper whatever: then you will ask what ailed her? why, sir, she simply swallowed a snail. Now, I can assure you, this is not an imaginary case. The first instance, in which it occurred, I ordered my herd to take her off at once, during the night, to the next town, and sell her for what she might bring; he went to bed and slept rather long, and when he got up to take her off, he found her quite well. I watched the next case, and remained with her three or four hours, until at last she coughed up a snail, when she appeared quite well. I believe it is only with some cows that snails produce this great sickness.

Milk abscess, or inflamed elder, is a very disagreeable affection to graziers; for it goes on to abscess: the animal is often months before she recovers. In every case I have had, I cured the disease in a couple of days, by means of friction with linseed-oil, and constant and continued stuping and poulticing with scalded bran. The great secret is to be unremitting in the applications, until the disease yields; and if you do not see to it yourself, herds will seldom take the trouble. Should a cow turn out a bad milker, it is often a great object to

dry her at once for fattening: I never failed in drying them in a few days, and have frequently never taken any milk from them after calving, but dried them at once, by the administration of a stringent internally, and the application of tar-oil, turpentine, vinegar, and linseed oil, to the elder. Should any gentleman present desire it, I will feel but too happy in giving him the exact proportions I have found successful in every case.

Lastly, I shall make a few remarks upon the management of calves and their diseases. For some years graziers and gentlemen have imported well-bred calves from Liverpool, at a heavy expense; and I have known a gentleman get over twenty, and lose fourteen or fifteen of them in one fortnight. A few days after arriving, they begin to droop, are seized with a purging of a thin, white discharge; they refuse their milk, and are very soon run down. Now, that is an inflammation of the alimentary canal, brought on by their getting bad milk, and at irregular hours, and from exposure to cold on their passage over. I had some so effected myself. I at once placed them in a warm, dry place, and gave them small quantities of boiled milk, with rhubarb in it, every three or four hours, and I succeeded in saving every one of them.

Another cause of death in calves is, from their not being muzzled when born, or soon after, and the muzzles kept on for three weeks or a month, until the animal begins to ruminate. I lost several fine calves when about a week or a fortnight old: they would refuse their milk, bowels become confined, and die in a couple of days; and, on opening their stomach, I always found a hard ball of coagulated milk, and a piece of hair, or a straw, or a piece of rag, invariably formed the nucleus of it. I afterwards had them muzzled; and for the first day or two after birth, I had some salt and lukewarm water mixed with their milk, and I never lost another from that cause. The sun often kills calves, when they are placed under its influence at an early period of their existence. You put out a calf, a few days old, about twelve o'clock in the day; it lies down, with a scorching sun shining upon it. You come back in a couple of hours, and find it extended a full length; the eyes are dull, and it appears quite stupid and lethargic; if you put it standing, it falls down again, and will continue in that state till it dies. In every case I found the milk had formed a large, coagulated ball in the stomach. By keeping them in till the cool of the evening, I never lost another from that cause.

Another very fatal disease is what is called black-leg, which is a rapid form of mortification, seizing upon the thigh and loins of the calf. You see the animal has a halt, or drags the hind leg a little. On feeling the thigh and loin, you at once perceive a

crackling sensation under the skin in the cellular structure. Extensive incisions is the only remedy I ever found successful; and they must be made early, and extend a little into the sound flesh, and be dressed with warm turpentine dressings, that nature may be enabled to throw off the dead mass by means of the living. I have no doubt the disease is highly infectious; so that the calf should be buried the moment it dies, away from the rest, as I have seen convincing proofs of its infectious nature.

I shall not trespass further upon the patience of the Society than while I relate a case of malformation which it is as well to be aware of. I had two beautiful twin calves, which the first day appeared quite healthy and lively; but the day after their birth, I perceived one of them lying on the ground, its feet extended out, its abdomen quite swollen, and its tail extended. The first thing I examined, was whether the bowels were right; I found its dung quite natural; but on a close examination, I found a strong membrane completely excluded the vagina, and passed up, so as to cover the urinary canal. I at once passed a gravel director from above down, and divided the membrane; the animal immediately passed a great quantity of urine, perfectly recovered, and I sold her after for a good price.

I beg to return the members present my best thanks for the patient and kind hearing they have given me, and beg to add, that I have merely stated what I have seen myself, and the result of my own practice.

*Lotion useful in Mouth Disease.*—Take sulphate of zinc 1 oz., burnt alum 3 oz., vinegar 1 pint; mix them together.

*Ointment for Feet.*—The feet should first be well washed with soft soap, in a solution of common tar, and then the following ointment applied twice daily; Take sulphate of copper 1 oz., sulphate of zinc  $\frac{1}{2}$  oz.; to be rubbed down, when powdered, with 1 lb. lard and  $\frac{1}{2}$  lb. tar.

*For drying a Cow.*—The following draught to be given the cow after milking her in the morning:—Take alum, roche alum, turmeric, of each 1 oz.; dragon's blood,  $\frac{1}{2}$  oz. Mix them in a quart of skim milk.

*Liniment for rubbing Elder.*—Every second day, two or three times. Take oil of tar, spirit of turpentine, vinegar, linseed oil, of each one naggin, and mix.

JOHN TOLER, M.D.,

Fellow of the Royal College of Surgeons, Ireland; Member of the Dublin Society, and Acting Member on the Agricultural Committee, and Agricultural Museum Committee.

66, Blessington-street, Dublin.

After reading the above valuable paper, a discus-

sion ensued on several points connected with the treatment of cattle labouring under disease, in which the Chairman, Dr. Harrison, Mr. Dycer, and other gentlemen, took part; and a vote of thanks was passed to Dr. Toler for his very useful and practical communication.

### CHIPPENHAM HUNDRED FARMERS' CLUB.

The January meeting was held on Wednesday the 26th of January, 1853, when, in consequence of the President having undertaken to introduce a subject for the consideration of the meeting, the chair was occupied by Mr. Edward Little. The subject was—

#### THE PROSPECT OF THE BRITISH AGRICULTURIST.

After some prefatory observations, Mr. T. LITTLE said:—The settlement of the question of Protection must be of advantage to tenants, as they will be enabled to make their calculations with more certainty before entering on a farm; and it will be their own fault if they carry on business without a lease, or agreement, framed according to the altered circumstances of the times. The liberal manner in which many landlords have met the depressed times—either by a reduction of rent, or by making improvements on their estates, by draining, or putting up convenient buildings—has encouraged tenants to keep on their farms in hope of better times. The discovery of gold in one of our colonies, and in California, has made that article become plentiful; the consequence is that a stimulus has been given to trade and commerce which must eventually extend to agriculture; in fact, its benefit is already felt in the better demand for most of the articles of farm produce. Although there is likely to be great benefit from large importations of gold into this country, the inducement for the lower classes to emigrate will shorten the supply of labour; and it is likely that higher prices must be given to labourers, more particularly where the country is thinly populated. The probability at no distant time of the substitution of direct for indirect taxation, or the removal of the duties on those articles of subsistence which now affect the poor man—such as tea, malt, sugar, &c.—will be of benefit to the farmer; for if these articles were cheaper the poor man would have more money left to buy meat, cheese, or butter. As regards the malt-tax, opinions vary as to the good that would result from its removal; but I think there is no question about its increasing the consumption of barley. If beer could be brewed at nearly half the price it is at present, I believe a good deal more would be drunk, and people who now have a little as a luxury would drink it as a common beverage. I have yet to learn that one of the principal articles of farm produce taxed at the rate of 75 per cent. can be a benefit to the producer of that article. The continual failure in the potato crop increases the consumption of wheat. The poor man and his family half subsisted on potatoes formerly; but now they are used very sparingly, and the price is become too high for many to be purchased. If the next year should prove to be as bad for potatoes as the last, people will be discouraged from planting them in this part of the country. The improvement in farming implements, and the application of steam-power to thrashing corn, is a great advantage to the farmer; he is now enabled to get his corn quick into the market, and have an opportunity, if a rise in prices should take place, to benefit by it. Another advantage of the

steam-engine is, the ricks can be thrashed in the field, which is a great convenience where the ricks are a long way from the barn, or where the bars are small. I have endeavoured to state a few reasons why the prospects of the British agriculturists are better than they have been; but these prospects I consider to have been made better by purely accidental circumstances—namely, the plentiful supply of gold, as before alluded to. As corn in some seasons was very low in price under protection, so it is not unlikely that with free-trade it may be high in price; with bad harvests, such as last year, and a bad yield of wheat, the supply will fall short, and prices advance; but with fine harvests, and an abundant yield, prices will be very low. The supply of foreign grain into this country will be always attended with uncertainty; any rupture on the continent may cause foreign ports to be blockaded, and supplies of corn, when most needed, may be shut out. At the present time, the freight from so near a port as Marseilles is 8s. per qr., and that, with the 1s. per qr. duty, is more than the agriculturists would have gladly accepted as a protective duty a short time since. The most shrewd calculator would be now puzzled to say what amount of foreign corn would be required before another harvest, or what the price of wheat per qr. may be; and if Mr. Caird could be successful in obtaining a return of agricultural statistics which he so much advocates, even then I doubt if any advantage would be gained, for if the stock of corn was found to be short, speculation would be on the alert to take advantage of this circumstance; and on the other hand, if the stock was plentiful, the markets would become depressed in consequence. The application of artificial manures to the growth of turnips, and an improved system of drill husbandry, is an advantage compared to what it was a few years ago, before the invention of the turnip drill for putting in manures. A piece of turuips may now be grown at about the same expense as carting a dressing of pot dung from some distance. I would here offer two or three remarks on a subject which may be of benefit, particularly to the young farmer about to commence business. In the first place I would advise him not to be too sanguine as to the yield of his crops, or calculate too high a price for his corn, for the uncertainty of the season, and the variable state of our markets, will often disappoint him. I would recommend a moderate outlay in implements; it is now a great temptation to a young man starting in the farming business, with a well-lined purse, to purchase scarifiers, drills, horse-hoes, &c., but they are very expensive, and require to be kept in the dry. Good drills and thrashing machines can be now hired at a moderate rate, and it is better to hire than have the expense of keeping too many implements in order. I would advise not so expensive a system of farming. Allow gentlemen of the Mechi school to make experiments, and if they succeed then they may be carried out. I think there is not much to fear for farmers occupying light stock farms where turnips can be grown, and sheep fed on them during the winter, but heavy wheat lands will be attended with difficulty. On the whole, I

consider that a farmer may, by diligence and strict economy, make a livelihood; but as to making a large fortune, such instances will be very rare.

The CHAIRMAN having invited discussion,

Mr. T. C. SCOTT said he coincided with a great deal of what had been advanced by the author of the paper. Had the question of Protection been sooner settled, he believed they would have had an adjustment as to rates, tithes, &c.; but so many arrangements had sprung up in the interval between landlord and tenant, that he apprehended the question would now be surrounded with some difficulty. He believed, however, that as the tenants had, during the last few years, to submit to serious disadvantages, no good landlord would be disposed to take advantage of them if future seasons should be more prosperous. As to a repeal of the malt tax, no doubt a greater consumption would increase the price of barley; but they must bear in mind that while we had the duty there was an entire prohibition of foreign malt; and if they repealed the tax, they

would also have an influx of foreign barley. He thought that Mr. Little had depreciated the value of statistics: in his (Mr. Scott's) opinion, if they were accurately obtained, they would be of great value to the farmer, as they would enable him to put himself in a better position with reference to the consumer.

Mr. T. LITTLE said there would be great difficulty in obtaining accurate returns, and if false they would be worse than useless. At present the farmer was generally guided by the quantity of ricks he saw in riding through the country.

Mr. SCOTT then adverted to the pressure of the income tax on the English farmer, and remarked that while in England the agriculturist had to pay on a rental of £300, in Scotland, owing to the exertions of a deputation, no one had to pay on a less rental than £450. Then returning to the subject of an adjustment of rentals, he handed in the following table, containing his views of what was fair and equitable between landlord and tenant:—

MODE OF REGULATING FARM RENTS.—Suppose the basis of the calculation to be, Wheat at 56s. per quarter, and the Rent 30s. per acre.

	FOR REDUCTION OF RENTS PER ACRE:—									
Wheat, per qr. . . .	66s.	57s. 0d.	46s. 0d.	45s. 0d.	44s.	43s. 6d.	42s. 0d.	41s. 0d.	40s.	
Deduct per cent. . .	—	2½	5	7½	10	12½	15	17½	20	
Rents, per acre . .	30s.	29s. 3d.	28s. 6d.	27s. 9d.	27s.	26s. 3d.	25s. 6d.	24s. 9d.	24s.	

	FOR INCREASE OF RENTS PER ACRE:—									
Wheat, per qr. . . .	56s.	61s. 0d.	62s. 0d.	63s. 0d.	64s.	65s. 0d.	66s. 0d.	67s. 0d.	68s.	
Add per cent. . . .	—	2½	5	7½	10	12½	15	17½	20	
Rents, per acre . .	30s.	30s. 9d.	31s. 6d.	32s. 3d.	33s.	33s. 9d.	34s. 6d.	35s. 3d.	36s.	

	A RENTAL OF SAY £100 PER ANNUM WOULD FLUCTUATE THUS:—									
Wheat, per qr. . . .	56s.	47s. 0d.	46s. 0d.	45s. 0d.	44s.	43s. 0d.	42s. 0d.	41s. 0d.	40s.	
Deduct per cent. . .	—	2½	5	7½	10	12½	15	17½	20	
Rents . . . . .	£100	£97 10s.	£95	£92 10s.	£90	£88 10s.	£85	£82 10s.	£80	

Wheat, per qr. . . .	56s.	61s. 0d.	62s. 0d.	63s. 0d.	64s.	65s. 0d.	66s. 0d.	67s. 0d.	68s.	
Add per cent. . . .	—	2½	5	7½	10	12½	15	17½	20	
Rents . . . . .	£100	£102 10s.	£105	£107 10s.	£110	£112 10s.	£115	£117 10s.	£120	

In conclusion, Mr. Scott adverted to the pressure of local taxation and the evils of the present law of settlement, and expressed his opinion that though it would be an exception to the rule of unrestricted competition, yet he believed it would be generally recognized by those in authority—that it would be wise to have a prohibitory duty on the importation of fat stock. At present the continent sent us a large number of half-fat animals; but if we could be permitted to feed all the cattle in England, it would lead to the production of one-third more manure, and thereby conduce to better crops, while the increase of the cost of meat would be so trifling that it would not be felt by the consumer.

The CHAIRMAN said he had no doubt that the prospects of the agriculturist were much improved, not so much from the settlement of the question of free trade or protection as from the great discovery of the age—the gold fields of Australia; this had afforded an impetus to manufacturers, given employment to labour, and tended to augment the value of farm produce. But he warned them not to place too much reliance on present prices, because a bad harvest had had much to do with it; and he greatly feared that small crops at good prices would scarcely balance good crops at less prices.

Mr. WILTSHIRE stated that he had not a good sack of wheat out of his whole harvest.

The following resolution was then carried unanimously:

“That from the settlement of the long agitated question of Protection and Free-trade, the British farmer will now be the

better enabled to make his arrangements in taking his farm; and, in consequence of the great activity in all branches of manufactures of this country, and the great discovery of the age, ‘the gold fields of Australia,’ the present prospects of the British agriculturist are much more favourable than for some years past; but, at the same time, the meeting is of opinion that it would not be wise to place too great reliance on the present prices in making calculations for the future, as the late unfavourable harvest and subsequent wet season have had much influence upon the present comparatively high prices of many articles of agricultural produce.”

At the termination of the ordinary business, the members of the club, to the number of thirty and upwards, sat down to a substantial supper, provided by the landlord of the “Bell.” This deviation from the usual practice was owing to the fact that the evening had been fixed for the

PRESENTATION OF A TESTIMONIAL TO MR. THOS. SCOTT,

a gentleman who for the last three years has acted as the agent of Joseph Neeld, Esq., M.P., and who on leaving for the purpose of establishing himself as an estate and land agent in the metropolis, carries with him the esteem and friendship of the entire neighbourhood. As soon as his resolution was made known to his friends, a committee was formed for the purpose of concerting measures for presenting him with some permanent token of their high “appreciation of his services

in assisting to establish and support the club; for having given his time and experience in instructing them in the theory and practice of draining, and for having carried out the most extensive practical drainage operations ever undertaken in this district; as well as for his devotion to the improvement and advancement of agriculture generally." Mr. Scott's friends also wished emphatically "to add their testimony to the unremitting zeal with which he has assisted in carrying out the philanthropic views of Joseph Neeld Esq., for the interest and lasting benefit of the town of Chippenham." No sooner were the plans matured than subscriptions were eagerly offered, and we observed that foremost on the list was the name of Joseph Neeld, Esq., for a sum which very plainly evinced his high appreciation of the abilities and character of Mr. Scott. A sub-committee consisting of Messrs. T. and E. Little, with the secretary, was then appointed to select and purchase a suitable piece of plate, and we are free to confess that their choice was not less creditable to their own taste and discernment than the skill and enterprise of the Messrs. Payn, of Bath, by whom it was supplied. The testimonial consisted of a substantial and extremely elegant silver inkstand, with a costly salver of the same material. The inkstand, to our taste, was singularly beautiful, and presented a very charming adaptation of the Egyptian style of ornament. On the central sarcophagus were the initials T. S. ingeniously combined in a very characteristic monogram; whilst on the base was the following dedication, very beautifully engraved:—

Presented  
(with a Salver),

To Mr. Thomas Scott,

By the Members of the Chippenham Hundred Farmers' Club,  
As a mark of friendly esteem

For his great exertions in Establishing the Club,

As well as for the devotion of his time

To the improvement and advancement of  
Agriculture in the Neighbourhood.

1853.

On the removal of the cloth, Mr. T. Little, as President of the Club, consecutively proposed the healths of the Queen, Prince Albert, the Prince of Wales, the rest of the royal family, and the Army and Navy.

The CHAIRMAN said he now proceeded to that which constituted the more immediate business of the evening; and he had only to regret that the task which now devolved on him had not fallen into abler hands; for on occasions like the present it was generally expected that the individual entrusted with the performance of the duty would discharge it in a suitable manner. He regretted that he could not command eloquence commensurate with the occasion, but what he wanted in words he would endeavour to make up by good feeling and good will. (Applause.) About three years ago this club was established owing to circumstances of a purely accidental character. He believed it was known to them all that his (Mr. Little's) late brother Robert having met several gentlemen after business connected with the receipt of some rents, a conversation ensued which resulted in the establishment of this club, which since its formation had been tolerably successful. At their first or second meeting Mr. Scott gave them a lecture on draining,\* and he (the Chairman) thought every one who heard it would agree that it was one of the most masterly productions on the subject that was ever brought out; it combined all the theoretical part of the matter, with

its plain, practical working out. On other occasions gentlemen had brought forward plain practical remarks, but Mr. Scott had given the finishing touch which none but a man of experience and education could impart, and they had felt very grateful for his assistance. The very handsome manner in which Mr. Neeld had headed this subscription fully testified to his appreciation of his abilities; and he (the president) thought he could say with the utmost degree of truth, that no one could have worked harder to carry out the system of drainage which they owed to the enterprise of Mr. Neeld. And now (said the president) I don't know that I need offer any further observations; I therefore at once proceed to present to you, Mr. Scott, this testimonial, intended as an expression of our esteem and friendship, accompanied by the hearty wishes of every member of this club for your health, happiness, and prosperity in your profession. (Cheers, and three times three).

Mr. SCOTT rose, amid very cordial cheering, to return thanks. He could assure them that whether or not on any former occasion he had been wanting in language to give expression to his thoughts, he not only felt it difficult but absolutely impossible to express his feelings on the present occasion. He never was placed in a more embarrassing position. It was impossible for him even now to look on their handsome testimonial without deep emotion, and it would hereafter be still more impossible to revert in memory to the circumstances connected with its presentation without feelings to which words could not give utterance. In the first place he never anticipated anything like this at their hands; and in the second, he felt that he did not deserve it. They were aware that he came amongst them in dark and dreary times, when the farmer was struggling with difficulties, such as he hoped he would never have to do again, and when no one could, with confidence, point to anything good for him "looming in the future." In these circumstances it was extremely difficult to decide what to do; but having acquainted himself with the position and requirements of the tenantry, he laid his views before Mr. Neeld, and in every thing savouring of improvement he had been seconded with the utmost liberality. (Cheers.) Believing, as he did, that without a good understanding on all sides, it was impossible that a landlord should enjoy his property, or a tenant keep up his confidence, he had always done his best to promote and establish it. The chairman in his very kind remarks had been pleased to advert to the interest he had taken in bringing forward the subject of drainage as a topic for consideration by the members of the club; but although the subject had cost him a good deal of reflection and labour, he was fully compensated by the spirit in which his observations were received. But he (Mr. Scott) did not tell them that ever since he was 17 years of age he had been farming in the Lothians; or that, after having had the benefit of the tuition of Mr. Smith of Deanston, he went to Cheshire and was, for two consecutive years, the successful competitor for the drainage medal offered by the Manchester and Liverpool Agricultural Association, and that it was only by an accident that on the latter occasion the medal was not placed round his neck by the then Lord Stanley, the late Prime Minister. He had no hesitation in telling them that what had been done in the Lothians was fallacious in principle. On the theory and practice of drainage he adapted himself to the times; as these were not stationary, he endeavoured to advance with them; and he referred with satisfaction to the fact that during the period of his connection with Mr. Neeld the following

\* Published in *The Farmer's Magazine* for February, 1851.



extensive system of drainage had been carried out on his estates in 1850-51-52—

Number of farms drained . . . . .	34
Quantity of pipes used . . . . .	2,430,000
Number of miles drained . . . . .	456
Acreage . . . . .	1,715
Expenditure . . . . .	£5,501

He (Mr. Scott) was also happy to inform them that since the late rains he had had the whole course of this drainage inspected by competent and experienced persons, who had found the drains perfect in every respect—a result which was not more satisfactory to the tenantry than to his own feelings. The next thing he had to touch upon was the improvement of stock, which, with the concurrence of Mr. Neeld, he had sought to effect. And here he was not going to assume any merit to himself beyond a certain amount of zeal which induced him to go to his friends and neighbours far and near; and if this were the proper time and place he might mention the names of many persons who had given him the most valuable assistance in this important matter, and some of whom had travelled hundreds of miles for the purpose of raising and elevating the character of the stock of this district. The next thing to which he directed his attention was the Chippenham market; and in this he thought he was fully justified, because he could not fail to observe that the tenants must derive benefit from the great facilities there afforded for the transaction of business, and the increased traffic thus produced. With regard to the Chippenham Agricultural Association he had undoubtedly felt much interest; but the late Mr. Robert Little was so able a secretary that all he (Mr. Scott) could do was mainly to assist in carrying out his suggestions and afford any assistance of which he was capable. The next subject to which he wished to refer, was the Hiring Fairs which had been recently established in this district with such signal success. He knew that these had been run down, as if they bore a resemblance to the slave markets of Constantinople; and though in the abstract some objection might be urged to them, yet they were necessary evils, and being such it was a matter of great moment to see that they were conducted with the greatest regard to morality and order. Apropos to this, he had recently met with a description of a Christmas Hiring Fair in a town on the west coast of Scotland. The scene, said the writer, was somewhat of an animating nature. The mirth and good feeling that prevailed amongst the masters and servants were considerably enlivened by the performance of two pipers, who, in their zealous rivalry to outstrip each other, turned out their

budget of tunes in endless variety. As the shades of evening, however, began to close in, the streets became deserted; but in proportion almost as this was the case, the innkeepers and tavern keepers began to reap a rich harvest, and a general scene of dissipation wound up the business of the day. Now he begged them to compare this state of things with that which presented itself at Chippenham, where the hiring fairs were conducted under the superintendence of the clergy, supported by the countenance and assistance of the ladies and gentry of the neighbourhood. It required no remark to render it evident that, so long as fairs of this kind existed, it was extremely creditable to all persons that they should be conducted in the manner which had been latterly done at Chippenham, with the warm and active concurrence of Mr. Neeld. After advertising in feeling terms to the loss which the club and neighbourhood had sustained in the death of their late respected president (Mr. Robert Little), Mr. Scott proceeded to comment in terms of high admiration upon several papers which had been read by members of the club, and after paying a well merited compliment to the liberality with which his views had been seconded by Mr. Neeld, whenever he was convinced of the wisdom of his recommendation, he concluded as follows:—I shall still study to retain your good opinions and esteem, and have no fear that your future actions will belie your uniform hospitality and kindness whilst among you. I can therefore say “farewell,” with some degree of confidence that the day is far distant when

Lightly you'll speak of the friend who is gone,

Or e'er in his absence upbraid him;

Then little he'll reck, while his name may live on,

With the good friends that Wiltshire has made him.

(Loud and continued applause).

The health of the president (Mr. T. Little) was then proposed by Mr. Scott, warmly received by the company, and very happily acknowledged by the subject of the toast. To this succeeded the health of Mr. Caleb Painter, the treasurer and secretary, who in replying to the very cordial reception which was given to his health, said he was amply rewarded for any exertions he had made by the success which continued to attend the club. In conclusion, Mr. Painter proposed the health of the new members, coupled with the health of Mr. Cail. Several other toasts, including the health of the Editor of the *Wiltshire County Mirror*, were afterwards given from the Chair, and the proceedings were characterized throughout by the utmost harmony and cordiality.

## A FEW WORDS ON THE POLITICS OF AGRICULTURE.

BY A PRACTICAL FARMER.

*Agricultural Protection.*—British agriculture has from time immemorial received encouragement and protection from the legislature of these realms, in one way or another. Legislative enactments to promote the prosperity of agriculture are of very early date: the first we read of is in the reign of our Edward VI. At several subsequent periods *encouragement* was given, by permitting the exportation of wheat when the price was unremunerative at home, *i. e.*, in 1562, when the price fell to 10s. per qr.; in

1593, when the price fell to 20s.; and in 1623, to 32s. per qr.: and *protection* was given by the act of 1663, imposing a duty of 5s. 4d. per qr., under certain regulations. And thus encouragement and protection were continued to agriculture up to the year 1846. Sometimes it was by bounties upon exportation, sometimes by prohibiting importation, and again latterly by the imposition of duties upon importation; and this under various regulations from time to time. Of course, during this very lengthened period, many

interests sprung up, and became settled, in connexion with the land and landed proprietors of the kingdom. The land became the mainstay; and by the encouragement given to its agriculture, it was made to bear all the principal burdens of the country. Nearly all the taxes, the tithes, and the rates were derived from the land. It was made to provide for the support of the *government of the country*, the religious instruction of its *inhabitants*, and the maintenance of its *poor*. Nor do we offer any grave objections to these impositions at this early period: there was no other feasible resource. The land—the inalienable, unexportable land—was made to support, and to be the safeguard of the whole system or regimen of government economy; and it was therefore fostered, encouraged, and guarded accordingly by the government. If a burden was put upon it, provision was made to enable it to be borne; and as additional burdens were in one shape or other laid on, so additional provision, by legislative enactments or otherwise, was made for its support. Land at every period met with aid corresponding with its requirements, and there was no resource so reasonably adapted for taxation as this fundamental staple of the country—the land; and so long as provision was made—so long as means were given to enable it to bear and pay all demands upon it, no one had much reasonable ground of complaint. Moreover, according to modern notions—and we think the version right in itself—it is the *consumer* who pays for all! Does he? “Stop a bit!” Yes; the *consumer* pays all! The consumer pays the taxes, tithes, and rates derivable from land—when he voluntarily taxes himself for that purpose; not otherwise. He has, however, latterly, by misrepresentation, violent outcry, outrageous threatening, &c., contrived to evade the tax. We used to pay for him in the good palmy days of Protection, nor did we care how much we had to pay both for him and for ourselves, provided we could arrange the account fairly between us, and had the means given us to do it. But how is it now? Why, just this. The *consumer* goes to the cheapest market; and if John Bull’s yeomanry can’t supply him as cheaply as the Frenchman, American, Turk, Pole, or any one else, they may just sell what they grow, and pay these said imposts themselves; for he don’t want their produce, and he is determined, notwithstanding, to leave these matters of payment to them. At all events he won’t pay tithes, and but a trifle or so of the other two. Is this *consumer* to keep up his income, pay one-third less for his food and clothing, and shirk payment of his fair share of public burdens? Is the land to be burdened with all these payments when the means of payment are taken away? Gross injustice!

*Tithes.*—Tithes are impositions upon the land for the purpose of providing religious instruction for the

inhabitants of the country; and they have, like the taxes, and for the very same reasons, been a burden upon the land from time immemorial. The first account we have, according to our reading, is the gift by Offa (we believe, one of the early kings of East Anglia) of the tithes of his kingdom to the church, as an expiation for having perpetrated the crimes of incest and murder. Subsequently, when the many petty kingdoms into which this country was divided became united under one monarch, and when, as Blackstone says, at the first establishment of parochial clergy, the tithes of “the parish were distributed in a fourfold division; one for the use of the bishop, another for maintaining the fabric of the church, a third for the poor, and a fourth to provide for the incumbent—when the sees of the bishops became otherwise amply endowed, they were prohibited from demanding their usual share, and the division was in three parts only” (*Blackstone’s Commentaries*). By degrees, however lamentable, the clergy of those days, in conjunction with the suppression of the monasteries, caused the absorption of the whole; and very soon afterwards the legislature were compelled to make separate provision for the relief of the poor; and in consequence the well-known act of the 53rd of Elizabeth became the law of the land—the basis of England’s poor-laws. Great modifications and changes have constantly been made in the system of taxation, for carrying on the machine of government, in accordance with the altered position of the country; and as the growth of other interests and the prosperity of its inhabitants enabled them to share the national burdens, many and varied have been the imposition of taxes; as witness, the customs, the excise, the post-office, the stamps, and many like sources of revenue; still it was relieving the land to a very great extent, by distributing the burdens more equally over the whole community. But that worst of all burdens—that dead weight upon agricultural progress, upon the energy, skill, and industry of the occupiers of the soil—the burden of *tithe* remained the same, till it became so intolerable, so unbearable, that immediate alteration was found to be imperatively necessary. Accordingly it was *changed*; it was converted into a charge upon the rent; by which change we verily believe the clergy derive a greater and more certain income than heretofore. It was a boon to the improving occupier, though to the bad one an evil: better for him to pay tithe in kind rather than a rent-charge upon bad farming. *Tithe*, then, is now commuted for a *rent-charge* upon the land—a charge upon the rental of the kingdom; but it is in fact essentially the same, as respects the amount to be raised, as before; and, what is more, it is the only department in the state subject to such exclusive taxation. Land is still made, though under another name, to pay for—

to provide for the religious instruction of all the other classes of the community, powerful and populous as they now are. We say emphatically this is wrong. Why are the many millions employed in the various departments of industry into which the capital and energies of the inhabitants of this great country have subdivided them, to require the land, the soil of the country, to provide them with religious instructors? to pay for their instruction? This might be feasible, perhaps right, in "the olden time;" but it cannot be so now. All classes, then, must and ought to contribute their proportionate share, and the payment of this impost must be apportioned in accordance (as we have before stated in reference to taxation) with the altered position and requirements of the country. We again say, most emphatically, that it is unjust to tax exclusively the broad acres of this kingdom to pay instructors to teach those who have no other connexion with land than as consumers of its produce. We say that *population*, and not *land*, should now form the basis of taxation for the support of religious teachers; if, indeed, such tax is to continue. We say it is monstrously unjust to oblige one class to contribute such immense sums for the benefit of the remaining classes. If this is not class legislation, what is?

*The Poor's Rate*, the Highway Rate, the County Rate, the Church Rate, are all impositions on the land in a higher proportion than is fair and equitable. It is upon the actual value to rent—rateable value—that such imposts are levied. This includes all property (except religious and charitable houses) *standing on the soil*: these, according to their rateable value, are subject to the tax. This mode of taxation for the support of the "aged and infirm poor" might have been correct in the time of Elizabeth, but what an alteration in the relative position and circumstances of the country since that period! What was the state of the shipping interest, the trading interest, the manufacturing interest, the commercial interest, the mining, railway, and other interests, at that early period? These comparatively are of recent origin—the mode of levying rates substantially the same. The proportion employed on the land in these days is not excessive, probably not a moiety; and yet it is called upon to contribute above three-fourths of the whole amount required to maintain the pauperised population. Why are the occupiers of land to be called upon to support the decayed sailor or the pauperised manufacturing labourer, artisan, journeyman, clerk, porter, and the like? The members of these vast and important interests employ an immense number of workmen, from whose labour they derive astonishing wealth; and yet, as a class, they are comparatively exempt from their support when worn out in their service; they contributing merely in just such proportion as their dwelling-houses or

their places of business may be worth to rent: the rest is thrown upon the land. This, we again say, is wrong. Equity demands that each class shall bear its proportion of this burden also. We repeat, that the basis of taxation is wrong on this point. We think the impost should be partly thrown upon land, partly upon income, and that proportionately. Land might be regulated by the rental as at present, and by being more widely extended in its operation. We would adopt *union* RATINGS instead of *parochial*; ships we would assess according to value or tonnage; manufacturing, trading, commercial, and other like interests, in like manner, to the number of workmen or hands employed by individuals engaged therein, or upon the amount paid to labourers, or for work done.

*Highway Rate.*—The same general reasons would apply to this rate, as also to the county and church rates, why land should not form the only basis of taxation. So far as these relate to the roads, it is just and equitable for those who make most use of them that they should contribute most towards repairing them. Great economy would arise in the management of parochial roads by throwing them into convenient districts, and placing them under intelligent superintendence: the roads would be better kept, and these district officers might readily be placed under the direction of local boards, or, if it could be so arranged, under control of the board of guardians.

*County Rate.*—The great complaint here is that the rate-payers have no control over the expenditure. This, and the basis of taxation—*land*—is also wrong. Here the principal outlay is for the maintenance of police, prisons, and prisoners; which, being for the benefit of the *morals* of the community, and not for the *land*, we think population should form the basis of taxation, and that a number of rate-payers from each union should be elected to act in conjunction with the magistracy as a county board; this board to have the control of the county rate, and the management of the pecuniary affairs of the county. The elected members should at least equal in number the magistracy, and possess equal votes and authority at their meetings.

*Church Rate.*—This is a very unpopular and obnoxious tax. We say, throw it at once on the Consolidated Fund, and thus get rid of this little vexatious impost, which in most respects stands in the same category as tithes—as an impost for the support of religion, chiefly derived from the land.

Having noticed the great charges or taxes on the *land*, we now come to the taxes on its products.

*The Mall Tax: The Hop Duty.*—These taxes, according to modern notions of political economy, must be quite an anomaly. Taxes upon food are becoming every day more unpalatable; and although *beer*, the

common beverage of the poor, may not be called food, yet it comes so near it that we wonder that advocates of this class don't more insist upon the abolition of all taxes tending to enhance its price. It is not only a tax upon the people's beverage—their drink—but it is also a tax upon the agriculture of these realms to a vast amount. It fetters the workman, it fetters the farmer, it fetters the trader. The truly hard-working man requires a wholesome stimulant; for his *beer* he pays four times its natural price, and is almost debarred by the price of malt and hops from being his own brewer. 'Tis only the opulent farmer that can advantageously grow hops; the payment of duty and expenses of cultivation are far beyond the means of many farmers. It also discourages the culture of barley; it is only the barley of best quality and weight that will pay for malting, and this kind can only be grown in a few favoured districts, on the best barley lands. Inferior barleys, for the most part, are not worth the cost of culture, and are therefore discarded as a crop on soils capable of producing good common qualities. If freed from the malt tax, these sorts would be malted, and come into more general use for brewing and cattle feeding: this would lead to extensive growth and great consumption. It fetters trade: none but men of capital can with much advantage carry on business either as hop-merchants, maltsters, or brewers. Reduce or abolish these taxes, and these merchants will increase and many vast monopolies be done away with.

Instead of a few, we fear we have made too many words upon our politics; we must therefore reserve our observations upon those restrictions which prevent the culture of some products, and the beneficial application of others, as tobacco, beet-root, &c., &c. We would, in conclusion, urge our readers to make every constitutional effort to remove all unequal, and consequently unjust burdens from the land. All protection and encouragement being withheld, and the community having refused longer to tax themselves as *consumers*, to enable the class of agriculturists to bear the general burdens of the country, and to pay the unequal taxation imposed upon them, makes it imperative upon them (the consumers) to reduce or abolish every oppressive tax—oppressive because unequal. If the grand aim of the present day be realized, in making this country the great workshop or emporium of the world, its primitive and rural character, now on the wane, will be entirely changed. We therefore emphatically say, that as this change proceeds—as the new order of things displaces the old—so must the old basis of general taxation, the primitive soil of the country, give place to a new one, which ought to be founded upon the wealth and riches of the community, from whatsoever source it may arise. Our remedy for

existing evils lies in the proper adjustment and equalization of the burthen of taxation, including taxes for the support of government, taxes for the support of the church, of the poor, of the county expenditure, and repairs of highways. Our panacea for agricultural distress, or rather for advancing its prosperity, lies in the abolition of all taxes pressing peculiarly upon agriculture, such as the malt tax and hop duties, and in the removal of all restrictions upon the sale and transfer of land, upon its culture, and upon the cultivation of any and every crop, or upon the mode of its adaptation for use.

#### MR. HODGES' PLAN FOR REDUCING THE HOP DUTY.

I feel confidence in recommending the adoption of the mode of relief contained in the accompanying bill. This plan will ensure £15,000 a-year revenue, without expense in collection beyond the ordinary per-centage, without difficulty and without complaint. The defence of the measure will be found in the Parliamentary return, showing the wretched shifts to which every former government has been obliged to resort, in order to get this duty, since 1819; and which must this year again be repeated, for the farmers, owing to the impossibility of sowing their wheat, will be in the deepest distress. There is also every rational expectation of a failure in the crop of hops, so that the large sum owing for the last year's duty can only be obtained generally by the excise pressing for levy warrants, which has already commenced.

By limiting the amount of both English and Foreign duty (so long as any duty is to be paid) to that originally fixed by the government of Queen Anne, and which continued with scarcely any beyond a fractional alteration, until Mr. Pitt laid on the war duty in 1803, during the time of the paper currency, the recurrence to an old precedent will bespeak its justification; and the granting an option to the English planter of compounding for his hop duty at the rate of £3 per acre will be almost universally adopted, and thus save the country the expense of collection, as the parochial collectors will assess and charge the parties, and collect the amount when the other taxes are collected; thus giving the benefit of a known and fixed charge, and by so doing also at the same time extinguishing that species of gambling, which the present mode of charging the hop duty has created to a sad extent. You will easily perceive the necessity for the provision in clause 5 in the bill, where the duty on the crop of the present year is not to be charged at all. The reason is, that the very great majority of the planters will avail themselves of the permission to compound, and in order to do so they will be required to declare their intention to the parish collector, within two months after the passing of the Act, and consequently will be required by the said collector in the spring of 1854 to pay the first moiety of the composition along with the other taxes; so that unless the present duty on the crop of this year, which there is every probability will be a small one, be excused, the planter would have to pay in 1854 two duties for the same crop, *viz.*, that by "weight" and that by "composition." The only variation in the provisions of the Act of Anne that I would suggest, is to allow the importer of foreign hops the same time to pay his duty as the Act allows the English grower, *viz.*, six months.

## LONDON FARMER'S CLUB.

"THE MOST ECONOMICAL AND BEST METHODS OF BREEDING AND KEEPING CART HORSES."

The monthly meeting of the members of the London Farmers' Club was held on Monday, March 7th, at the Club House, Blackfriars, Mr. Tretheway in the chair. The subject for discussion being "The most economical and best methods of breeding and keeping cart horses."

The Chairman said the question appearing on the card for consideration, was one of those purely practical ones to which it behoved the tenant farmer to direct his attention in a pre-eminent degree; and he had great pleasure in introducing to them Mr. N. G. Barthropp, himself a most successful breeder of horses, who had kindly undertaken to open the discussion upon the subject.

Mr. N. G. BARTHROPP, of Cretingham Rookery, Woodbridge, Suffolk, said, I hope you will allow me to explain the circumstance which causes me to appear before you this evening, in December last I received a circular from the secretary, asking if I would attend the annual club dinner, and containing a request from the committee that members would suggest any subject they might think desirable for discussion for the ensuing year, and as I had occasion to propose a new member, I wrote to Mr. Corbet for that purpose, and said I thought it would be very desirable if some member of the club would bring forward as a subject for discussion, "The best and most economical way of keeping cart horses." I little dreamed that I should be called on to do anything in the matter, but, to my surprise, a few weeks afterwards I received a letter from Mr. Corbet, informing me that the subject stood in my name for introduction (Hear). This being the case, I had no alternative but to collect a few facts relative to the subject, and I have now to crave your indulgence for the imperfect manner in which I may introduce it. In treating of the first part of the subject—"The best and most economical method of breeding cart horses," I am not aware that I can suggest any new ideas to you. Although I believe the same system ought to be pursued in breeding every description of cart horse, I can only state what is the custom of breeders in my own county, and with the breed of cart horses that I believe is almost universally admitted to be the best for agricultural purposes, as witnessed by their great success when exhibited at the meetings of the Royal Agricultural Society, where of course they are put in competition with horses from all parts of England (Hear, hear). It is the custom with most of the farmers in East Suffolk to breed a few foals every year. The mares are generally put to the horse about the first week in the month of April, as at that time the stallions begin what is called "the season," which lasts 12 or 13 weeks. Now, as it ought to be the

object of every breeder to breed the most valuable animal that he can, it is greatly to be regretted that they do not pay more attention in selecting horses for their mares, instead of, as is too often the case, pursuing that "penny wise and pound foolish" system of putting all their mares to one horse, which is perhaps an inferior animal, merely for the sake of saving trouble and a little expense, not taking into consideration the relative form of the mare and the horse, and judging whether they suit each other—a system which is almost certain to result in disappointment (Hear, hear). It is most important to get brood mares free from all natural defects, and to be very careful about the pedigree not only of the mare, but also of the sire; for on the principle that "like begets like," if you breed from mares showing any tendency to hereditary disease, even if it does not show itself in the first generation, it is almost certain to do so hereafter. With reference to stallions, I think some allowance must be granted to them, for however desirable it is to breed from a perfect animal, it would still be unwise to reject a well-bred and well-formed horse for some trifling blemish, which may have been brought on by the treatment to which he has been subjected. As it generally happens that the entire colt is obliged to be confined before he is two years old in a small yard and stable, where he is fed high, with little or no exercise until he is old enough to travel, to prepare him for this it is the almost necessary but absurd fashion to load his frame with as much fat as can possibly be put on; he is then taken, laden with fat, and made to travel from twelve to sixteen miles a day, and to cover any number of mares that can be procured. Under this treatment, it cannot be wondered at that the legs, &c., occasionally give way. It is usual on some farms to work the mares during the time that the foal is upon them, in which case it is necessary to give both mare and foal corn, so that there is not much gained by the plan, although at intervals during the turnip-sowing season it may be very desirable to render every horse available for work; still as a general rule I object to working the mares during the time they are suckling their foals (Hear, hear). The time for weaning is generally in September, from which period until it is turned out to grass the following spring the foal should have not less than a quarter of a peck of oats per diem, in addition to other food, such as carrots, swedes, mangold, &c. If the weather be fine in the autumn, foals will do remarkably well during the month of October, and even later, upon good upland after-grass, or on a maiden layer, provided they can be brought home at night to a yard and shed; for it is most important that all young animals should, for the

first year at any rate, have good dry, warm lodgings. The following summer the colts should have good grass, and if it is thought desirable to get them fit for work the ensuing spring, when they will be two years old, it may be done by good feeding through the winter; if not, mangold or swedes, cut with Gardner's turnip cutter, and mixed with cut chaff, is the most economical food for them. They may then go out to grass again, and be fit to work (two colts doing the work of one horse) either at Michaelmas, to assist in the autumn cultivation and wheat sowing, or they may be allowed to run till they are three years old, when they certainly ought no longer to be idle (Hear, hear). The colt at three years old is generally thought fit to take his regular work upon the farm; but considerable discretion is required in apportioning his work so as to prevent a possibility of his being overdone or knocked up; as I believe it is the fact that a horse that is thoroughly knocked up, as a young one, is nearly certain to remain a slug all his life (Hear, hear). Having thus stated my views as to what I consider the best plan of breeding and rearing the cart-horse, the next point to be considered is, how he can be best and most economically fed; and here it is that I feel my inability to perform satisfactorily the task I have undertaken. The question involves many considerations, and must greatly depend upon the nature of the soil, the situation of the farm, whether it lies well together, or whether it lies straggling about; also upon the system of cultivation that is pursued. These contingencies, as well as others, must regulate in a great measure the number of horses to be kept. I have ever found the greatest care required in apportioning the horses to their labour; and I believe that more injury is done to a horse by one excessive day's work, than by twelve months' work that he is quite equal or superior to. In fact, horses and their keep form such a heavy item in the expenditure of a farm, that too much attention cannot be paid to spare the former, and economise the latter (Hear). And now arises the question, "What is economy." Most certainly not starvation, or keeping the horse below his work; but rather on the contrary, to keep him well, and above his work. This can only be done by constant and regular good feeding. I have ever found that I could not adopt the short or low feeding system for a limited period without repenting, and that it cost me more to restore the animal to a good state of condition than if I had continued liberal feeding; and by that means have kept him in better condition through his work, and have had the additional pleasure of seeing him look well all the time. When stover is so plentiful that it can be allowed *ad libitum*, I consider one bushel of beans (equal to five pecks of meal) a good allowance for a horse per week. This, mixed with chaff, affords a good and substantial bait, twice a day; but when hay or stover is sent into chaff, either with or without straw, and given with the corn, care should be taken that it is clean and wholesome, or the horse may be induced to eat with corn what he would otherwise refuse, and

which may be very prejudicial to him. When wheat or barley chaff is given with corn, it is absolutely necessary that it should be well sifted. To do this effectually, I have frequently had it sifted with a large sieve, the same bottom as the baiting-sieve, previously to its being put into the chaff-bin; thus preventing at a small cost the ill effects that might else arise from the carelessness or negligence of the horsemen in not properly sifting the chaff. The feeding horses with roots is economical and judicious, whether Swede turnips, mangold, or carrots: either of them cut with Gardner's turnip-cutter, and mixed with chaff, spares the clover greatly, and improves the health of the animal. Here, perhaps, I may mention a fact that is, I think, but seldom noticed; viz., supposing 34 tons of mangold to be grown per acre, then, according to some tables published by the late Rev. W. L. Rham, one-fifth of an acre, or thereabouts, would produce as much nutritive matter as an acre of hay, supposing the produce to be two tons. The relative value these roots bear for feeding purposes is, in my opinion, swedes good, mangold better, carrots best. Some persons object to giving beet-root to mares that are in foal; I can only say that I have invariably done so, without any ill effects arising from its use. It is almost invaluable food for horses as spring and summer advances; but I have had no experience in feeding horses with carrots, as my land is not adapted to their growth. I believe, however, it is the opinion of many practical men, that they are dear food for bullocks, though they are the cheapest food that can be given to horses. When stover is short, indeed at any other time, the following is a cheap and valuable addition to horse keep: linseed or linseed meal boiled in water until it becomes a mucilage, and poured over as much chaff as it will saturate. The following involves less trouble, and perhaps answers as well: steep one pint of linseed in two gallons of water, for 48 hours, and then pour the mucilage over sufficient chaff to absorb it; any description of chaff will do, but bean straw is the most nutritious, which may easily be cut into chaff when the beans have been mown. I am borne out in the statement that bean straw is more nutritious than any other by the before-mentioned tables, which show that 140 lbs. of bean straw is equal to 100 lbs. of hay, whereas 374 lbs. of wheat straw is required to supply the same amount of nutritive matter. The soiling of horses in yards and sheds during summer is now generally adopted; and there is undoubtedly great saving in thus consuming green crops, whilst a large quantity of valuable manure is made. Where the practice is not pursued it is in consequence of there not being a succession of crops to mow. On most heavy land farms tares are sown at intervals to ensure, if possible, a succession of food, until the second crop of clover comes to the scythe. Sometimes rye or oats are sown with the tares to keep them off the ground and from rotting, and indeed I have seen a very useful piece of green food produced by having a small piece of rye sown by itself, to cut up with dry food for perhaps a fortnight before the

rye and tares are ready to consume. Lucerne comes early in spring, and very opportunely between the different crops for soiling, when there is any land on the farm suitable to its growth. Or perhaps Italian rye grass may be preferable, as it will grow on almost every soil, and it certainly produces a very large quantity of food. The natural pastures are sometimes mown for soiling horses in the yard; but with this food they certainly require a full allowance of corn. Low meadows should be mown early for soiling purposes, when the second cut will be very nutritious, and horses will do better on it, and consume the second cutting with more relish than the first; but care must be taken to save up the grass (which can be done on low meadows) so as always to have a succession of young sweet grass to mow. Strict attention is here necessary, as stock will not eat this description of grass in its green state, when it has stood too long. Another point relative to the health of the horse, which requires the master's watchful eye, is that his lodging is good, as it is of the utmost importance that he should be kept clean and dry. In my neighbourhood the cart horse is too often obliged to make out with open yards. When this is the case, the liquid manure should be led by drains into a tank, or light earth should be placed at the bottom of the yard to absorb it. A shed in the yard is of little general good, as two or three of the horses are sure to be masters over the others, so that if they attempt to get under cover, they only get kicked or driven out again, and I think nothing can be worse for a horse than to be turned out into an open yard during the wet nights in winter after a hard day's work. So desirable, indeed, do I feel it to be that no water should be allowed to fall on a horse's back after his day's work is done, that I venture to assert that a horse in a loose box or good covered yard would do better with four pecks of corn a week, than with five or six pecks if exposed to the vicissitudes of our climate in an open yard (Hear, hear). Having made these general remarks as to the feeding of cart-horses. I will conclude by giving you the system pursued by a friend of mine who has paid great attention to the subject. He has come to the conclusion that it is better, taking everything into consideration, to keep a small number of well-fed horses, than a large number upon inferior food. There is less outlay for horses, harness, &c.; fewer men are required to work them; there is no excuse for a small day's work being done, if the horses are well fed and in good condition; besides which, if the horses are in good condition, the men naturally take a pride in attending to them, which they will not do if they are poor. His farm consists of 480 acres of arable; all heavy land, and heavy mixed soil. He keeps 19 horses, that are selected with a view to hardihood and activity, and he finds that large horses do not last so long as horses of a medium size; in fact, he says, "Above all I dislike a large horse, even if he could pull a castle down at a slow pace." In the following scale the provender is charged at an average price of beans at 32s. per qr., oats 24s. per qr.,

hay at £3 10s. per ton, and beetroot or swedes at 2d. per bush. After harvest the horses are put upon full feed for September, October, November, and half of December, and the allowance per week is —

	s. d.	£ s. d.
Beans, 5 pecks at 1s. . . . .	5 0	
Oats, 2 pecks at 9d. . . . .	1 6	
Hay, 1 cwt. . . . .	3 6	
Root, 4 bush. at 2d. . . . .	0 8	

10 8 .. 15 weeks .. 8 0 0

Half December, January, and February:—

	s. d.
Beans, 3 pecks . . . . .	3 0
Hay, 1 cwt. . . . .	3 6
Roots, 4 bush. . . . .	0 8

7 2 .. 9 weeks .. 3 4 6

Half February, March, April, and May:—

	s. d.
Beans, 5 pecks . . . . .	5 0
Oats, 2 pecks. . . . .	1 6
Hay, 1 cwt. . . . .	3 6
Roots, 4 bush. . . . .	0 8

10 8 .. 15 weeks .. 8 0 0

June:—

	s. d.
Beans, 5 pecks . . . . .	5 0
Oats, 2 pecks. . . . .	1 6
Grass or tares . . . . .	2 0

8 6 .. 4 weeks .. 1 14 0

July and August:—

	s. d.
Beans, 3 pecks . . . . .	3 0
Clover, grass, or tares ..	3 0

6 0 .. .. . . . . . 2 14 0

So that the cost of each horse for the year is . . . . £23 12 6

Mr. THOMAS was sure the gentlemen present felt particularly obliged to Mr. Barthropp for the interesting paper he had just read to them. It contained a great deal of very useful information, and he thought it was calculated to be of much service to those tenant-farmers who were in the habit of breeding cart-horses. At the same time they must not allow the remarks of an individual member of the club to go forth as the general opinion of the meeting at large. He could very well conceive that Mr. Barthropp had an idea that the Suffolk breed of horses was superior to any other breed in England. He himself had thought so for many years, and perhaps still thought so to some extent. Nevertheless, in practice he found, although the breeders of this sort of horse had been successful competitors at the exhibitions of the Royal Agricultural Society, the feeling that the Suffolk horse was superior to any other kind of breed of cart-horse was confined to a rather small and limited district of country. At all events, so far as he was concerned, he had spared no pains or expense in order to obtain the best breed of Suffolk cart-horses he could meet with. Early in life he purchased four of the finest cart-mares belonging to the late Sir Bethell Codrington, and was very successful in breeding from them. On entering upon his present occupation, seeing the estate of the late Lord Huntingfield advertised for sale, he attended the sale, and bought the four best of 40 mares upon the

estate; and the same day gave a commission to his friend Mr. Barker, of Badwell Ashe, to send him two of the best mares of the same breed he could find, and for which he paid 70 guineas. Now, although he (Mr. Thomas) was convinced of the excellency of the stock raised from these animals, yet he could not get his Bedfordshire friends to think anything of them; and when he sent their progeny to Bedford Cattle Show, they were pooh-poohed, and any colt or filly, with great Harrylegs, carried away the £10 prize from them. In fact, it was utterly impossible to convince people in Bedfordshire that anything good in the shape of a horse could come out of Suffolk (a laugh). Now, he did not say so himself; but he must admit that, on a fair trial of hard work, the Suffolk cart horses were a tender description of horse; and that they could not, upon the same amount of food, do the same work, or carry the same quantity of flesh that other horses would. He spoke against his inclination, because his inclinations were in favour of the Suffolk breed; but his farm was a farm with steep hills and land hard to be worked in the valleys, and he did not find that the horse-keepers, who had other breeds of horses as well as the Suffolk in their charge, could keep the latter in anything like the same condition as the former, if they did the same amount of work. And he must say he was sorry for it, inasmuch as it went against an old prejudice of his. As to the breeding of foals, he quite agreed with Mr. Barthropp, that it was necessary to be particularly careful in selecting their mares. In no description of farming stock, whether cattle or sheep, were the progeny so sure to inherit the defects or good points of their sires and dams as in horses. (Hear, hear). It was observable in a most extraordinary degree (Hear). Generally speaking, he was accustomed to breed about four foals a-year; and it was remarkable that any peculiarity in the breed—a crooked leg, a bad-shaped hock or loin in the mare, for instance—was almost as certain to exhibit itself in the progeny as for day to succeed the night. He felt, therefore, that he could not too strongly impress upon the minds of those who might read in the journals which recorded the proceedings of the club an account of what had taken place to-night, the necessity of selecting the best mares to breed from (Hear). Some years ago, being at the time a very young farmer, he was anxious to save the mares in foal all the labour he could, and in the process he generally lost about half the number of foals that are dropped in the course of the year. But during the last fifteen or sixteen years he had made it an invariable rule to work every mare in foal, though gently and carefully, up to the last moment before foaling. And from the period of adopting that practice, though the mares were frequently taken out of the chains in the field for the purpose of foaling, he had never lost either mare or foal (Hear, hear). This proved to him that gentle, prudent exercise was conducive to the health of a mare heavy in foal. After foaling of course the case was very different; and there was no doubt, if the mare should be

spared from work, it would be a great advantage both to her and the foal. His own rule was to give his mares rest in the interval from the foaling until the colt was weaned. During the first winter it was his custom to keep foals in small paddocks of four or five acres, with sheds in them; allowing them, as recommended by Mr. Barthropp, a quarter of a peck of oats, and cut stover *ad libitum*. And the better this valuable portion of a farm-stock could be kept during the first winter, the better would they come to the collar when two years old. He wished his friends in Bedfordshire would look with some degree of favour on the Suffolks, which were certainly a very pleasant breed to work with a flat light land; but it was a fact that in that county they were not approved of.

A MEMBER asked what, in Bedfordshire, was considered the best sort of horse.

MR. THOMAS: Why, the large Harry-legged colts which they bought at Rugby fair. At five years old these fetched 60 guineas a-piece, whereas he could not sell his Suffolks for more than 30 guineas a-piece.

MR. W. F. HOBBS: The last remark which had fallen from Mr. Thomas convinced him that that gentleman had not taken the right animal at starting. If he could not obtain more than £30 for a Suffolk gelding in high condition, surely there must have been something wrong at the beginning; he could not have bred the animals rightly, or could not have managed them in the best manner for bringing them to market in proper trim. Otherwise he (Mr. Hobbs) did not know where he did go to obtain a Suffolk gelding at that price in the present day. In a common way, the Suffolk gelding made from thirty to fifty guineas, and good mares about the same amount. And for breeding purposes it was notorious there was no description of cart mares so valuable as the Suffolk. The demand for them was a pretty conclusive proof of their value. He (Mr. Hobbs), like Mr. Thomas, had started in favour of this breed of horses. At first, however, he hesitated whether it were better to take the Suffolk or the Clydesdale. In the north of England, and parts of Scotland, he found that the Clydesdales were a very useful breed, very active, and perhaps excelling many Suffolk horses. But then there was a want of constitution about them, and a want of character, which convinced him that proper attention had not been paid to their breeding; some for instance were brown with white legs, others black with white legs, and others again all grey. In fact, he could not discover in any district of the country, and scarcely in a single team, a general uniformity of character. After travelling through the north, therefore, and returning to the eastern counties, he resolved to breed the Suffolk horse, on account of its uniform character and constitution; and experience had taught him that, where proper attention was paid to them, the Suffolk horses, on account of their activity, were the best for agricultural purposes in the kingdom. One point of importance to the English farmer was, whether or not he should breed the dray horse for agricultural purposes and sale. It was



certainly a very expensive horse to keep, and was liable to many diseases, some of which had been inherent in the breed for generations. Now, whether farmers should, for agricultural purposes, breed that enormous animal which had been more the fancy of the London brewers and draymen than anything else, was a question for farmers themselves to decide. For his part he thought they should breed horses suited to their own requirements rather than for the purposes of the brewers—horses that would come to early maturity, possessed hardy constitutions, were free from disease, and were long-lived. He believed the heavy dray-horse, the coarse-legged Lincolnshire and North Warwickshire breed were worn out at twelve years old; but when he went into Suffolk, he found in the stables there and at work animals from twenty to twenty-five years old; some he had seen which had attained twenty-eight, and in one or two instances thirty years of age. Now in many of the large breweries, such as Haubury's, when their horses reached their twelfth year, they were deemed of no further use, and as worn-out animals were shot. Moreover, he understood they were seldom able to stand the wear and tear of the paved streets of London even to that age (Hear). He did not mean to say that the Suffolk horse was perfect. On the contrary, there was still much room for improving the breed. Many years ago they were crossed with a foreign breed, for the purpose of increasing their size; and it succeeded in that respect for a time, but eventually had injured many of their points. Still there were a few pure-bred Suffolk to be found in that county, and he must say that Mr. Barthropp's stock was amongst them. That gentleman had been the most successful exhibitor of Suffolk horses, and had always kept an eye to size, at the same time he did not forget the symmetry and the quality of the animals; and he (Mr. Hobbs) felt deeply obliged to him for the valuable paper he had communicated to the club that evening (Hear, hear). In process of time, he was satisfied that the horse that possessed great powers in less compass than that which was now used by the London brewers would become the fashionable horse in their establishment. One point in the Suffolk horse peculiarly worthy of notice, was its greater freedom from disease than the other breeds of cart-horse. Whether that circumstance arose from the climate in which the animal was bred, or the attention paid to it by the breeders of East Suffolk, certainly he had found, from personal observation, it was less liable to diseases than any other breed he had met with (Hear, hear). And for agricultural purposes, we had nothing superior in the kingdom (Hear). He hoped farmers would pay more attention to their breed of horses in future. It was important that they should look at the activity of the animal. The roads of the country were everywhere becoming greatly improved, the implements for draught were very much reduced in weight, and they would therefore do well to attend to that particular point (Hear). In going through the Lothians he did not find a single horse employed in agriculture that was reined up. It

was too often the case in this country that the horses were trained to walk the pace of the men, instead of the men walking the pace of the horses (Hear, hear). That system was very injurious to the animal; it spoilt his temper, and took away his muscle. Nothing on a farm, he believed, would pay them better than the good breeding and proper care of horses. He quite agreed with Mr. Barthropp that it was better to have a few horses, and keep them well and always ready for work, than to have a great number below par. The proper management of cart-horses was worthy of special attention, and derived increased influence from the circumstance that machinery was now so extensively applied to agriculture. He could not conceive how a farmer cultivating one hundred acres of arable land could do with less than four horses, which could not be properly kept at a less cost than 10s. per week, or £26 per annum; and he believed that that item of expenditure was quite equal, generally, to the cost of manual labour. That showed how important this subject was, and that the committee had done well in setting it down for discussion.

Mr. THOMAS explained: His remarks applied, he said, especially to Bedfordshire. He had little doubt that his breed of horses would in Suffolk occupy a very respectable position; but in Bedfordshire, from the very fact of his breeding Suffolk horses, he was nowhere (laughter).

Mr. SHEARER had an impression that a vast number of Suffolk horses might be sold at a high price for heavy broughams, and other carriages of the same description; and in that way the breeding of them might prove as profitable to agriculturists as the sale of them for dray work.

Mr. TATTERSALL thought the opinions put forward by Mr. Barthropp were those at which all would arrive who went into the matter. The great point as regarded breeding was, to get the finest mare that could be obtained, whether they were breeding race-horses or cart-horses. In the present day it was necessary to go rather for activity than for size or weight; it was the active animal which would best enable them to meet the competition of the times (Hear, hear). If the brewer said he must have a horse of a ton weight, such an animal must of course be bred; but a light, active animal would best suit their own purposes. The same rule applied to the breeding of cart-horses as to the breeding of other descriptions of horses. He believed that for all purposes the thorough-bred horse was the best. With regard to the keeping of horses, there could be but one rule. Every animal ought to be kept as well as possible, especially for the first two or three years of his life; and the keep of a horse was all but thrown away if he were not well kept at an early period (Hear, hear). In the paddocks, near Hampton Court, he had observed horses which stood fifteen hands high at a year old displaying as much muscle at that age as many animals showed at two or three years old (Hear, hear). By a proper system of keeping horses two objects were secured: the animal was brought up to the highest

point within the shortest period, and the manure which came from him was most beneficial to the land. Activity, however, was the great quality which they should endeavour to secure in cart-horses.

Mr. WOOD said he had come there solely to learn. He was perfectly aware how far his county (Sussex) was behind other counties generally, and particularly as to its breed of horses. He believed the cart-horses in use in that district were for the most part brought from Rugby fair (laughter): instead of having colts to breed and feed for the London market they had the refuse of Rugby (laughter). The custom in Sussex was not to work horses in pairs, but in a line. He had tried during the last year to get his horses out of that system, and to work them in pairs, and in the most scientific mode; but he was sorry to say that he had made the experiment to his cost. Although his land was thoroughly drained, the horses had trodden as deep as the plough extended; and he regretted to state that he had been a loser by his attempt to alter his system. He had by the scheme lost a great part of his wheat season; and whereas he ought to have sown 150 acres, he had, in fact, sown only about 50. He was obliged, therefore, to go back to the old method. He really did not know how to get his horses to work in pairs, and steadily at the same time. He was surprised that more had not been said with regard to the feeding of horses. That was a subject on which most persons needed instruction. He had heard it stated that it was very advantageous to chop all the food; and having an opportunity of doing that at little expense, by means of water power, he was particularly desirous of information on that point. He had recently crushed oats for his horses. There was a tradition in Sussex that beans used to the extent which Mr. Barthropp recommended tended to make horses hampery, so that they required bleeding (Hear, hear). Beans, when given in large quantities, had, he believed, the effect of overheating the blood, and subjecting them to diseases in the legs. He had heard of a plan of feeding horses by means of a shoot; a trap-door being opened and the horse feeding himself. If that plan would answer, it was very desirable to adopt it; for men were too often negligent, and would not take the trouble to feed horses properly. It was very difficult to ascertain what plan was best on the whole. At one time he adopted the scheme of having a feeder to look after a dozen horses, and he must say that his horses never looked so well as at that period. The man had nothing else to do but feed horses. In this case much depended on the carter. In reference to a horse which was hard worked, he thought they could not do wrong in preparing its food, with the exception, perhaps, of beans, which the animal did not grind so much as oats. With regard to breeding, it was, in his county, very difficult to get good mares. He agreed with Mr. Tattersall that almost everything depended on the dam. In Sussex very little attention was paid either to the form of animals or the breed. If they were horses, that was enough; little care was exhibited with regard to the description. As to the Suffolk

horses, those which he had seen at the agricultural shows appeared exceedingly good, on the whole; but he could not discover in their legs that strength and stability which he desired to see (Hear, hear). He confessed he was not prepossessed in favour of the Suffolk cart-horses. The horses which he saw in Clydesdale pleased him better, because they had more weight in their hind quarters, and, generally speaking, stood firmer on their legs. He had been surprised at not seeing more of the Clydesdale horses at the agricultural shows, for compared with them many of the Suffolk horses were, in his opinion, hideous animals. (Laughter).

Mr. THOMAS explained. He had always found that horses which were kept at night in the stable did more work, and were in better condition, than those which were left exposed.

Mr. SHERRER said the Hampshire farmers would be very much obliged by any improvement, which could be made in their horses, which at present were very defective.

The CHAIRMAN said, before calling upon the gentleman who introduced the subject to reply, he wished to make one or two remarks; though he came there, not with the idea of speaking, but simply to listen. In the first place, he wished to confirm what Mr. THOMAS had said with regard to the Suffolk horses, and the other breeds of horses in Bedfordshire. He knew that Mr. Thomas had been an advocate for Suffolk horses, and had bred them himself to a considerable extent. He was one of the largest breeders, if not the largest, in the county; he (the Chairman) frequently saw his team on the road, and it always appeared to him in very high condition, and he had always understood from him that his horses performed a great deal of work. But he also knew that when Mr. Thomas's horses entered the Bedfordshire show-yard they seldom obtained a prize. In fact, the feeling in that county was, as Mr. Thomas had stated, against Suffolk horses. He was not surprised that so much had been said with regard to breeds: it was natural that such a discussion should elicit a great deal on that point, and he could not consider what had been said at all irrelevant. Still, he confessed he was surprised and disappointed that so little had been said with regard to keep. It was important to ascertain whether it was best to keep horses on oats or on beans, or whether there should be a mixture of the two. His own experience on the subject tended to show that it was best to have some of each; and if there were facilities on the farm for cutting the chaff, he would recommend that, having himself found the benefit of it. He did not feel competent to enter into the subject any further that evening, but it was one which deserved their best attention.

Mr. BARTHOFF then replied. He said he regretted that the discussion had turned almost entirely on the value of different breeds of horses, while little had been said with regard to the feeding of them. It was information on the latter point that he had chiefly designed to elicit. In the observations with which he opened the question he had suggested various modes of feeding which he thought

might be advantageously adopted either in part or as a whole. Mr. Thomas, who spoke in terms of disappointment of Suffolk horses, was rather unfortunate in purchasing animals which had belonged to the late Lord Huntingfield; for although his lordship was notoriously one of the best cattle and sheep growers in the country, it was equally notorious that he had bad horses. For several years he was absent from the estate, and during that period those who managed it got an inferior description of animals, which were sold in 1844. It was, he presumed, at the sale in that year that Mr. Thomas made his purchase.

Mr. THOMAS said it was in September, 1835; he then bought four mares.

Mr. BARTHOPE continued. A gentleman had remarked that the Suffolk horses appeared well-adapted

for Broughams. That reminded him that on the clay lands of Suffolk large horses were not found to perform so much work as the smaller and active ones; and he believed that the latter would on the whole be found the most useful to agriculturists.

On the motion of Mr. HOBBS, seconded by Mr. TATTERSALL, the following resolution was agreed to:—"That in breeding cart horses the greatest attention should be paid to the relative merits of the sire and dam, endeavouring to remedy the defects of the one by the good qualities of the other; and that true economy is best consulted by generous feeding and good housing, thus keeping the animal up to the work required of him."

Votes of thanks were given respectively to Mr. Barthroppe and to the Chairman, which terminated the proceedings.

### UPON FEEDING CATTLE WITH ROOT CROPS.

SIR,—In reply to one of your correspondents, who made inquiry as to the mode of feeding bullocks and other animals, I beg to state that I have little to add beyond what I communicated in my lecture delivered at the London Farmers' Club upon the "Economy of Farming," the details of which I will now offer. The mangold wurzels, or Swede turnips, are plucked (not sliced) with a machine constructed by myself, of which many are now in use in this district, and consists of a revolving cylinder, into which hooks are inserted, acting against a row of knives to facilitate the operation, and which *plucks* the roots of Swede or other turnips, and mangold wurzel, into small pieces from the size of an egg downwards, thus avoiding the sharp edges produced by turnip slicers, and preventing the choking of the animals, as well as facilitating the readily mixing them with the cut chaff. The latter is cut into 1½ inch lengths, in the proportion of one part of hay to three parts of straw, and is moistened by an application of linseed meal that has been previously steeped forty-eight hours in cold water, in the proportion of 1½ lbs. to 2 lbs. for each bullock, to which is added 4 lbs. of barley-meal, sprinkled in the chaff. The morning meal is prepared the evening previous, by mixing one bushel of the plucked roots with about two bushels of cut chaff, prepared as above; and in the morning the evening meal is prepared in the same way. If it is found the bullocks will eat more, it can be increased by adding chaff only, or with a further admixture of the roots. The advantages of this mode of feeding will, upon experiment being made, become at once apparent. The bullocks will thrive faster, and will never be relaxed, as is too frequently

the case when fed upon the roots by themselves, and the quantity of the latter per diem may be exactly apportioned. They will also eat the chaff cut from straw without hay, if found desirable. But when fed upon the roots alone, they will not rest satisfied until they have had their fill, and then will refuse chaff cut from straw altogether. The stomach of ruminating animals is larger than that of other animals, and requires to be filled before they will lie down to rest; and the large quantity of roots they will consume (if allowed to be fed without restriction) becomes absolutely injurious to them, whilst 50 per cent. more will be consumed with less benefit to the animals.

If oilcake is bruised and steeped in the same way, it will be found more beneficial than when given alone, and the whole of the nutritive properties will become extracted, as will be at once perceived by the difference of the manure; but the latter, of course, will at the same time not be so valuable.

With store stock one bushel of roots with cut chaff is sufficient, and one or more pounds of linseed meal per diem may, if required, be added; but if an attempt be made to keep them upon one bushel of roots, given separately, they will pine after more, and remain constantly restless and dissatisfied. The vegetable food may also be "marshalled to meet the jaws," and an exact calculation made of the extent of time they may be required to last.

I am, sir, your obedient servant,

Writtle, March 14.

ROBT. BAKER.

—Mark Lane Express.

EXPERIMENTS ON TOP-DRESSING GRASS LAND IN WINDSOR GREAT PARK.

COMMUNICATED BY ORDER OF H. R. H. THE PRINCE ALBERT.

The land marked I. in the annexed table was enclosed from open pasture and cropped for hay, for the first time. The land had received during the winter about twelve loads per acre of deer-pen manure, valued at 2s. per load. This manure seemed never to have produced any effect, in consequence of the long drought succeeding its application; and though its value ought to be stated against the crop, when considered generally, it has not been taken into account in the subjoined statement, which is intended to show a comparison between land under two artificial manures, and land of the same description without them.

The land marked II. was a portion of a meadow, which has long been cropped for hay every year. This land received no other treatment than the application of the artificial manures.

From this statement the benefit resulting from liberal top-dressing of grass is apparent. The aftermath on all the top-dressed land was also superior to that on the rest of the field, but no difference could be seen betwixt the two sorts experimented with. On the application of guano there seems to be considerably the greatest profit; but as experiments have been tried in other localities in which the nitrate of soda has had the superiority, the explanation of the difference in the effects produced must be sought for in some peculiarity of the soil. In both the following cases, the soil and subsoil consist of clay, not very tenacious.

It is believed that the difference in the produce of the dressed and the undressed land is greater than may be expected in ordinary seasons, in consequence of the weather and other circumstances having been exceedingly favourable for the application of the manures. No rain had fallen, and there had been constant drying easterly winds from February till the 22nd May, the day of application, and consequently the grass had made no growth whatever. The manures, therefore, on being applied, came immediately into contact with the roots, and on the 26th May genial rains commenced, which continued almost without interruption till the day of cutting. The surrounding grass seemed never to make a start all the season, which the smallness of the crop will show, while the top-dressed land improved daily.

F. H. SEYMOUR, Deputy Ranger.  
W. MENZIES, Deputy Surveyor.

Windsor Great Park,  
Oct. 22, 1852.

Land experimented upon.	Quantity of top-dressing.	Cost per acre.	Date of top-dressing.	Weather during the season.	Date of cutting.	Produce per acre.	Value at £3 per load of 1s cwt.	Produce of surrounding acres.	Value at £3 per load.	Balance per acre in favour of top-dressed land.
<b>I.—High Undrained Land.</b>										
One acre with Guano.....	2 cwt.	£ 4 8	May 22	Dry weather with easterly winds from middle of February to 26th of May.	July 22	30 3 4	£ 5 2 6	8 0 0	£ 1 6 8	£ 3 15 10
One acre with Nitrate of Soda	2 cwt.	£ 1 17 10	ditto	From that to the 6th of July heavy rains with warm weather.	ditto	29 2 0	£ 4 18 4	8 0 0	£ 1 6 8	£ 3 11 8
<b>II.—Low-lying Meadow Land.</b>										
One acre with Guano.....	2 cwt.	£ 4 8	ditto		July 16	27 3 0	£ 12 6 4	9 0 0	£ 1 10 0	£ 3 2 6
One acre with Nitrate of Soda	2 cwt.	£ 1 17 10	ditto		ditto	25 0 0	£ 3 3 4	9 0 0	£ 1 10 0	£ 3 13 4

Statement showing the result of experiments on Grass, in Windsor Great Park, with Artificial Manures, 1852.

## ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A WEEKLY COUNCIL was held at the Society's House in Hanover Square, on Wednesday, the 23rd of February; present: Colonel Challoner, Trustee, in the chair; Mr. Evelyn Denison, M.P., Mr. Druce, Mr. Gadesden, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Majendie, Mr. Mainwaring Paine, Mr. T. W. Pockock, M. Eugène Risler (of the late Agricultural Establishment of Versailles), Mr. Rowlandson, Prof. Simonds, Mr. Simpson, Mr. Augustus Smith, Mr. H. A. Smith, and Mr. Reynolds Solly.

**CABBAGE CULTIVATION.**—Mr. James A. Legard, of Lenton Hall, near Nottingham, favoured the Council with the following account of his management of the Cabbage crop.

The great difficulty I found in producing a good Cabbage consisted mainly in the uncertainty of being able to get good seed or good plants. They varied so much in quality, that it was impossible to place any dependence upon them. It therefore occurred to me some four or five years ago to turn my attention to improving the character of my Cabbages. With this view, I selected the stocks of the best plants, when they had arrived at maturity, for seed; choosing those of the closest texture, with the least disposition to burst or run to seed, and with short stems. The stocks were removed to the garden, and the seed collected the following year. I have done this for several years, each year selecting still the best; till, at last, my crop has become almost uniform in its character and excellence. The Cabbages were last year grown in the same field and by the side of my Yellow-Globe Mangolds, sown 30 inches apart in the rows, and produced nearly 30 tons to the acre, without tops and bottoms. The soil was strong loam, not clay; the manure, eight one horse cart-loads of good farm-yard manure and two loads of gas-lime to the acre, put on early in the spring, after a Wheat-stubble, which was sheared, and the long stubble ploughed in in the autumn, to keep the land hollow and exposed as much as possible to the atmosphere during the winter. The land was twice ploughed, with the ordinary amount of cleaning and hoeing, and the estimated cost of the Mangold was 5s. 6d. per ton. The Cabbage stocks were planted in the garden for seed on the 26th Oct., 1850. The seed was cut the 4th July, and sown in the seed-bed the 25th August, 1851. The plants were pricked out from the seed-bed the 25th September, 1851, and planted out in the field the last week in April, 1852. The weather being very dry at that time, they were watered with liquid manure from the farm-yard three times, at intervals of five or six days. They were planted at a yard apart. I will here mention a piece of economy, which is practised at no cost, in the mode of planting. The usual mode of planting a yard apart is to set the plants in rows one yard from each other, the plants being a yard apart in the rows, and planted alternately; but by this method, as plants grow in circles and not in squares, there is a loss of space. The plants should stand at the angles of a connected series of equilateral angles; and this mode of planting is applicable as well to trees and all large plants, the perpen-

dicular drawn from the vortex of such a triangle to the middle of the opposite side, representing the distance between the rows, while the hypothenuse (or either of the other two sides) will represent the required distance between each plant, such perpendicular and hypothenuse bearing to each other, in round numbers, the proportional lengths of 7 and 8 respectively. If for instance it is required to set plants 4 feet apart, they must be that distance from each other in the rows, but only  $3\frac{1}{2}$  feet between the rows; by which means about one-eighth of the land is saved, and an acre of land is made to grow 5,445 plants at a yard apart, instead of 4,840 planted in the usual way. My crop last year was exceedingly level. I took an equal quantity of the largest and smallest Cabbages, and weighed them; they weighed from 21lbs. to 35lbs., the average being 29lbs, and this, with 5,445 plants on the acre, gives the enormous weight of upwards of 70 tons. I should mention, however, that not having a sufficient number of Cabbages, I planted by the side of these other Cabbages, obtained from a nurseryman, which certainly did not average a third of the weight above stated, but were very irregular in quality and size, run to tops, burst at the heart, and made but a very moderate crop, so that I attribute the whole advantage I gained to that care in the selection and management which was given at so little or no cost. My neighbour, Mr. Paget, whose opinion on all questions in practical agriculture carries the highest authority, finds it essential to put the manure into land a long time before the Cabbages are planted, if possible in the autumn; mine were manured in the spring, but the manure was comparatively stale. The plants should not be kept long enough in the seed-bed to draw one another, because it makes them stalky, and the saps-vessels are restricted in size, as a short-stalked Cabbage will always be found to be a thick-stalked one.

Mr. Fisher Hobbs favoured the Council with a statement of the successful manner in which the cattle Cabbage was cultivated in the eastern counties. He had himself found it a most invaluable green food for his stock. He considered, however, that it was a particular point to sow the seed in the year previous to the one in which the crop was required: he had constantly found such plants very superior to spring-raised seed. He sowed the Drumhead variety in August, transplanted it in November, and planted it out in the field in April, each plant at a yard apart. He had also several acres constantly under cultivation with early Cabbages, such as the early York, Sugar-loaf, large Devonshire Paignton, and large late York; and he could obtain from his Cabbage crops not only fresh nutriment for his stock through the harvest, but by care in the succession he could if he liked obtain for them from the same source an abundant supply of green food up to Christmas. He had also early Yorks planted in November, which in May would be ready, and of sufficiently fine quality to send to Covent Garden. He had not found it necessary to make the selection of plants referred to by Mr. Legard, having never been disappointed in the

seed supplied him by Messrs. Thomas Gibbs and Co., the seedsmen to the Society, which he had constantly found to be of first-rate quality.—Colonel Challoner could fully confirm Mr. Fisher Hobbs's testimony to the value of this green crop. Since he had huddled his pigs during summer in the cool, shady places of his woods, and supplied them with water and cabbages, they had not only lost that tendency to deterioration which he had previously observed in them, but on the contrary had increased one-third in value. He had been led to adopt this mode of management from having witnessed, during his residence in Italy, the striking effects of that pasturing of herds of swine in the Chestnut groves of Sorrento, to which he had alluded on a former occasion when the same subject was under the consideration of the Council.—Mr. Mainwaring Paine agreed with Mr. Fisher Hobbs that there appeared no necessity to make a selection of plants for the purpose of ensuring good Cabbage crops. He had himself obtained his seed from the same source as Mr. Hobbs, and could bear his testimony to its excellent quality. He had from 20 to 30 acres planted with Drumhead Cabbage, from seeds sown at different times for the purpose of ensuring a succession in the supply. He found it admirably suited for his pigs, sheep, and oxen. Many of his Cabbages were found, on trial, to weigh 30lbs. each.

**RAPE-CULTIVATION FOR OIL.**—Mr. William Brotherton, of Wandsworth, Surrey, favoured the Council with a communication, strongly urging on the attention of the members the increasing value of Rape as an agricultural crop, in a commercial point of view, for the purpose of yielding seeds from which could be obtained that supply of oil which the increasing demands of machinery on the one hand, and the decreasing or uncertain amount of olive and other foreign oils, on the other, rendered so essentially important at the present time. He supported his opinion on this subject by numerical details, and pointed out the serious obstacle to the cultivation in question, occasioned by the prohibitory clause inserted in many leases expressly interdicting, or in a great measure limiting, its adoption, under the impression of its exhausting nature.—Mr. Rowlandson stated to the Council the results of his own experience connected with the Rape-cultivation in Lincolnshire. He condemned the waste occasioned by burning the refuse of this crop, which gave, on decomposition, to the atmosphere what ought, as well as those fixed substances which were left in the ashes, to be given back to the soil. He knew few crops less impoverishing than Rape, provided the stalks were rotted and applied to the land; it might, on the contrary, be made by judicious management exceedingly profitable as manure; but in Lincolnshire they did not nurse these things, although he believed they reckoned the Rape crop better for them than wheat. The mere abstraction of the oil from the seeds would not of itself, he thought, exhaust the amount of fertility, if the other constituents of the plant were but returned in various shapes back into the land.

With regard to the oil, although depreciated by its colour and odour, it was used extensively for preparing inferior clots, and for the purpose of lighting; olive oil was well known to be adulterated with it.—Colonel Challoner remarked that he grew the Gold-of-Pleasure Flax with great advantage on his land, which seemed peculiarly adapted to its cultivation; while from Linseed, he could not get back out of the ground one quarter of the seed he put into it for sowing. He put the straw into his boxes with the cattle, and found that it made a litter much superior as manure to that obtained from common straw; the seed he gave in winter to his bullocks and milch cows.—Mr. Druce, of Eynsham, stated that he found Rape better on strong arable land than Tares. He had a crop of 20 acres of it every year. He sowed for it in April, and it came up in about ten weeks, when he soiled his cattle with it, and afterwards ploughed-in the roots. He only sowed the dwarf Rape. He considered feeding off with rape as the best preparation for wheat on strong land.—Mr. Majendie had observed at Caen and Rouen that in November they sowed Colza after wheat, and that the plants in the following summer were transplanted in the most simple manner by merely turning a furrow.—M. Eugène Risler favoured the members with a statement of his own experience on the continent connected with the subject of Rape cultivation. The Rape, he observed, required a fertile soil, from which it extracted a large amount of manuring matter. It was, however, considered by the majority of farmers in northern France, in Belgium, and in Mecklenburgh and other parts of Germany, as the most profitable crop for their rotations. He believed that this favourable opinion arose from the estimate of the following circumstances: 1. The price of Rapeseed on the continent. 2. The high value of Rape-cake for fattening cattle, in the same manner as the Linseed-cake in England. 3. The use of Rape straw for the purpose of litter. When the farmers sold their seeds to the oil-crusher, they generally made it a condition of the contract that the cakes left after the extraction of the oil should be returned to them. The straw, he remarked, being very porous, absorbed with great facility the liquid manure with which it came in contact; but being a hard litter, if not already broken, it was, before employment for that purpose, spread out in the farm-yard and trodden by the cattle, and then carried into the stables, generally forming the first or lowest bed of the litter, over which a layer of Wheat-straw litter was placed. The cultivation of Rape, he stated, required a soil more strong than light, a loamy one being that which was best suited for the purpose. The rotation was generally the following one:—1. Turnip or Beet, well manured; 2. Oats or Barley; 3. Clover or Grass; 4. Generally Rape-seed, with a half-manuring; 5. Wheat, which succeeded very well after Rape. In Mecklenburgh the Grass was kept till May, and once pastured by sheep before being ploughed in. In strong soils, a half-fallow between Midsummer and autumn was considered as a requisite means for cleaning the land. The Rape was sometimes

first sown during June in a nursery, and planted out in the field during August; one acre of such nursery-ground being sufficient to furnish plants for five acres of field-planting. At other times, the Rape was in the first instance sown in the field where it was to form the crop; it being, however, in this case, sown in the month of July. In some years the first method succeeded the best, and in others the second, according to the temperature; but in a farm of any considerable extent, it was found convenient, for the distribution of labour, to cultivate one portion of the crop on the first of these plans. The seeds were generally drilled in. He then referred to the great injury inflicted on the Rape crop by insects in the early part of the spring of the following year; the only escape from which appeared to arise from planting the Rape in well-manured ground, so that the development of the plants from such amount of fertility might be more rapid than the destruction effected by the insects.—Colonel Challoner threw out the suggestion whether there was any reason to suppose that the insects in question were peculiar to the Rape crop, or merely transferred to it from the Grass which had been previously ploughed up.—M. Risler then proceeded to state that the harvest of the Rape crop was the first harvest in the year, and occurred in June; it was often difficult, however, in dry weather, to get in this crop, in consequence of the pods becoming very rapidly dried up, and shedding their seed before the whole could be gathered in; a loss of produce thus taking place in the seed, which being left on the ground, only interfered as a weed with the ensuing Wheat crop. For these reasons it was found best not to sow all the Rape at once, but portions only of it in succession, so that maturity might ensue at different times; also, when the seeds had not become entirely black, but only brown on one side, to cut the plants with a sickle as early as possible in the morning, but not during the heat of the day; allowing the crop when thus cut to lie on the field for a few days, until the seeds had fully ripened, a little rain in the case of Rape, or in that of Oats, being rather beneficial than otherwise. The Rape, when thus ripe, was either carried home in waggons lined with rick cloth; or, as in France and Belgium was oftener the case, threshed out in the fields, by being spread over cloths placed on the ground to receive the seed, and beat with short wooden rods.—Mr. Fisher Hobbs remarked, that he cultivated for particular purposes three different varieties of Rape, namely, an early dwarf Rape obtained for him by his bailiff from Dorsetshire, the common Rape, and the Irish Rape. For early feed, he preferred a mixture of the dwarf Rape with an early variety of Turnip; this he sowed in the first week in May, and in ten weeks got very excellent food for fat sheep, which being fed off, the land was ploughed, and the season not too late for sowing a green-top yellow Scotch Turnip he had met with in the Lothians, and which gave him a very good crop of roots ready for use in November.—Captain Stanley Carr was the first contributor who communicated to the Society a statement of the management of the Rape crop in Mecklenburg, a district in North Germany

situated in the same latitude as Yorkshire, with a climate, however, warmer and drier in summer, but colder in winter. He had remarked thirteen years ago in his Prize Essay (Journal, I., 125): "Where the land has a sufficient proportion of clay, Rape seed is sown broadcast in the end of July or beginning of August; this crop is greatly benefited the following spring by dusting gypsum over it, about 100lbs. to the English acre. In July the seed is ripe, and as the weather is generally fine, is trodden out by horses, very expeditiously, on large canvas sheets in the field. The oil of this seed, when purified, is without smell, gives a brilliant clear-burning flame, and is universally used all over Germany, in the saloon and the cottage. The value of the crop is very precarious, because it is subject to so many contingencies; the turnip-fly, slug, and caterpillar make war upon it when young, and when in flower a small beetle (*Maltia nemorum*) often eats away the blossom bud, or lays its minute larvæ in the petals, ultimately furnishing every pod with a maggot, which either eats the seed away, or, forcing the pod open when nearly ripe, causes it to fall out. When spared all these calamities, it is, however, a very remunerating crop, worth from £10 to £20 an acre, especially if there is a foreign demand. The straw is generally burned, and the ashes scattered over the field; it is sometimes sold to the soapboilers, who value it highly. Two furrows are then given for wheat, sown broadcast in September."

The Council having ordered their usual acknowledgments for the communications then made to them, adjourned to their monthly meeting on the 2nd of March.

A MONTHLY COUNCIL was held at the Society's House in Hanover-square, on Wednesday, the 2nd of March. The following Members of Council and Governors of the Society were present:—Mr. Pusey, Trustee, in the chair; Lord Camoys, Hon. Robert Henry Clive, M.P., Sir John Villiers Shelley, Bart., M.P., Sir Thomas Dyke Acland, Bart., M.P., Sir John V. B. Johnstone, Bart., M.P., Sir Montague Cholmely, Bart., Sir Robert Price, Bart., M.P., Mr. Raymond Barker, Mr. Barnett, Captain Stanley Carr, Mr. W. G. Cavendish, Colonel Challoner, Mr. Crosskill, Mr. Evelyn Deason, M.P., Mr. Garrett, Mr. Brandreth Gibbs, Mr. Grantham, Mr. Hammond, Mr. Fisher Hobbs, Mr. Hornsby, Mr. Hudson of Castleacre, Mr. Lawes, Mr. Mainwaring Paine, Professor Simonds, Mr. Simpson, Mr. Stanley, Mr. Crompton Stanfield, M.P., Mr. Thompson, Captain Vyner, Professor Way, and Mr. Wilson of Stowlangtoft.

FINANCES.—Mr. Raymond Barker presented to the Council the report of the Finance Committee, from which it appeared that the current cash-balance in the hands of the bankers, including the Gloucester subscription and special composition-balance, was £3,572. He also laid before the members detailed balance-sheets connected with the different departments of the Society's country meeting held last year at Lewes.

LECTURE ON FLAX.—Mr. Pusey reported the recommendation of the Journal Committee, that Professor

Wilson's offer to deliver a lecture before the members, "On the treatment and application, agricultural as well as technical, of Flax," should be accepted, and that the proposed lecture should be delivered in the Council-room of the Society on Wednesday, the 13th of April next, at 12 o'clock at noon. This recommendation was adopted by the Council.

**FINES FOR NON-EXHIBITION.**—Col. Challoner, chairman of the Fines' Committee, presented the following report to the Council on the subject of the fines connected with non-exhibition at the Lewes meeting:—

The Fines Committee beg to report as follows:—

1. That they have examined all the pleas transmitted in excuse for the non-payment of fees claimed, and have compared the various points set forth, with the exemptions stated in the rule; instructing the Secretary to inform the parties whose pleas are disallowed that they will be required to pay the fines stipulated.
2. That the Secretary be directed by the Council to address a second application to those parties who have neither paid the fines to which they are liable, nor have replied to the circular letter already addressed to them, informing them that if payment is not made by that day fortnight, their respective cases will be placed in the hands of the solicitors, requesting the recovery of the fines in question, by usual process in the Westminster County Court.

The Report was unanimously adopted by the Council.

**FARM POULTRY.**—Mr. Fisher Hobbs, Chairman of the Farm Poultry Committee, reported to the Council the unanimous recommendation of the Committee, after deliberate consideration, that the Council should adopt, without alteration, the schedule of prizes for improving the breed of farm poultry, suggested by the Society's three judges in that department at the Lewes meeting last year, namely, the Hon. and Rev. Stephen Willoughby Lawley, of Escrick; Mr. Thomas Barber Wright, of Birmingham; and Mr. John Baily, of London. These gentlemen, in their report to the Council, make the following remarks on the schedule proposed—"We have conferred together on a poultry prize-list, which we consider suitable for the Gloucester Meeting of the Royal Agricultural Society of England. The list transmitted to the Council has our unanimous approval, and it has, we beg to assure the Council, been very carefully considered by us. It is strictly practicable; no longer than is absolutely necessary; and well calculated, as we think, to stimulate farmers to improve the stock of their poultry-yards, an object which the Society has given evidence already that it is anxious to support. The arrangements required in the show-yard will be very simple; and the prize-list now submitted will not have reference, like the more extended shows at Birmingham, to feather and other properties, but will be of a different character, being intended to encourage the breeding of those varieties which are most valuable for the table, or the supply of eggs. Independently of any other consideration, it would be much better for the farmer to keep a pure breed, instead of a lot of miserable crosses; and the pure-bred birds arrive much earlier at maturity, as the value of live birds of a distinct breed is much greater than that of mongrels." The Council adopted

the schedule proposed by the judges, and recommended by the committee; ordering their best thanks to be transmitted to the judges for the favour of their report, and the trouble they had kindly taken on this subject. The schedule in question is divided into 13 classes, comprising 45 prizes, amounting in value to £108.

**GENERATION OF STEAM.**—Colonel Challoner, chairman of the Implement Committee, reported to the Council the recommendation of that committee, that the Society should have a portable steam-boiler for the purpose of generating steam for the trial of the fixed engines at its country meetings. The contract for the construction of such boiler, and its requisite fittings, to be offered by public notice to the tender of engineers, agreeably with detailed specifications to be drawn out by the committee, with the aid and under the advice of the consulting-engineer of the Society. The Council adopted this recommendation.

**GLOUCESTER MEETING.**—The following report from the General Gloucester Committee was received and adopted:—

The General Gloucester Committee beg to make the following report of their proceedings since the last monthly meeting of the Council:—

1. They have elected Mr. Raymond Barker, the Vice-Chairman of their Committee, to preside over their meetings in the absence of the Earl of Ducie, their chairman.
2. They have, agreeably with the reference of the Council, provided the land requested by the Rev. Samuel Smith, for illustration to the members, at the Gloucester meeting, of the system of cultivation practised by him at Lois-Weedon, in Northamptonshire.
3. They have made the requisite arrangements with Mr. Jones, the Secretary of the Gloucester Local Committee, for the supply of Wheat and Barley in the straw, for the trial of implements and machinery.
4. They have instructed Mr. Henry Manning, the contractor of Works to the Society, in the prosecution of the several works connected with the meeting, and they lay before the Council his report on that subject.

**CERTIFICATES.**—On the motion of Mr. Brandreth Gibbs, a committee was appointed, consisting of the stewards of the cattle-yard, Mr. Fisher Hobbs and Mr. Brandreth, to revise and recommend some improvements in the form of the certificates sent in for live stock.

**VALE SHEEP.**—Mr. Holland, of Dumbleton Hall, Evesham, placed at the disposal of the Council the sum of £50, as the amount of further prizes for sheep bred in the district of the Society's Country Meeting at Gloucester, in July next. The Council ordered their best thanks to Mr. Holland for this instance of his liberality, and his desire to promote the objects of the Society at their Gloucester meeting; referring his communication and offer to the General Gloucester Committee, to decide how far the present prize-list would admit of Mr. Holland's wishes being carried into effect.

**DRAINS: COTTAGERS' WELL AND PUMP.**—Mr. Slaney regretted to find that the implement prize-sheet had been finally closed at the previous monthly Council, and its distribution made; otherwise he should have been glad to renew his offer of a prize for a plough to fill in the soil cast out of drains. He hoped, however,



to offer it again in time for next year's meeting: in the meantime he trusted the attention of implement-makers would continue to be directed to the invention of so useful an implement. He took that opportunity of giving notice, that he should make a statement at a future Council Meeting, connected with the construction of a cheap well and pump for cottagers, on a new principle, and which he had found to answer remarkably well.

The Council adjourned to their weekly meeting on Wednesday, 9th March.

A WEEKLY COUNCIL was held at the Society's House, in Hanover-square, on Wednesday, the 9th March. Present: Lord ASHBURTON, President; Hon. John Jervis Carnegie, Mr. Barugh Almack, Mr. Raymond Barker, Mr. H. Raymond Barker, Dr. Calvert, Mr. W. G. Cavendish, Colonel Challoner, Mr. Dyer, Mr. C. C. Ferard, Mr. Gadesden, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. K. G. Key, Mr. Majendie, Mr. W. Napier, Mr. Mainwaring Paine, Mr. Pocock, Mr. Powell, M. Risler of Versailles, Mr. Rowlandson, Professor Simonds, Mr. Augustus Smith, Mr. Reynolds Solly, and Captain Vynor.

DARTMOOR BARLEY.—Mr. G. W. Fowler, of Dartmoor, transmitted to the Council a sample of his Barley, grown at 1,100 feet above the level of the sea, on land which four years ago was dotted over with large granite rocks. It was sown about the middle of March last year, after a crop of Swedes, which were all carted off. He thought the yield would be about 5 qrs. per acre.

WHITE BELGIAN CARROTS.—Mr. Edward Smith, of Isabel Mead, Harbledown, near Canterbury, favoured the Council with the following account of his cultivation of the White Belgian Carrot.

I beg to offer a few remarks on the cultivation of the White Belgian Carrot, and the system I have followed for several years in Wales upon a poor stony shallow soil scarcely six inches deep. I plough the land early after harvest, either Wheat, Barley, or Oat stubble, and in November, if dry weather, balk or ridge up the land to remain for the winter. About the middle of April, if the ground will work well, harrow and pick off all the Couch or Grass, and again strike out the furrows from 20 to 24 inches apart, and haul or cart in the balks about 20 loads of dung, and cover in the same as for Turnips. I have found this plan answer so well that I have adopted it in preference to the usual way of putting the dung on either in the autumn or spring, and ploughing it in, and have always found the Carrots free from scab, and quite straight, and have had far better crops. Upon the ridge I draw with a small hoe a shallow furrow, and sow the seed by hand, with a tin two feet long made like a funnel. I have had a much better plant by sowing by hand, which amply pays for the extra expense. The seed is then covered in by a boy following with a rake. I find from the middle of April until the first week in May the best time for sowing the seed. I do not approve of too early sowing, as the young plants are apt to be cut off by the spring frost, and much stunted and injured, and never appear to thrive so well after. I find about 4lbs. of seed sufficient for an acre, and I wet the seed a week before sowing, mixed with a little sand. As soon as the Carrots appear above the ground, so as to be seen in the rows, I take

advantage in dry weather to hoe between the drills, to give air to the plants. When the Carrots come out into second leaf, and to be clearly seen from the weeds, I have boys to pull the weeds in the rows by hand twice before I thin any of the Carrots, as it gives an opportunity of seeing where they should be left. I leave the Carrots about 4 or 5 inches apart, and never allow the hoe between the plants, as they can be much better done by hand, and without injury. I do not use the horse-hoe until the Carrots get up strong, as the earth is apt to fall upon the crown. I have found by taking the earth from the Carrots after they are about half grown they have been much larger. I usually commence digging the roots about the middle of November, and I lay them in lumps about 40 bushels on the field, or cart them off into clamps and put a good covering of straw first and well thatched afterwards. I find they are better left without earth, unless very sharp frost. I have had the white Carrot keep in this way up to the middle of May, and have been quite sound and as good as when first put in, which is a great advantage in the spring for sheep and other stock, when the Swede Turnip is not so good late in the season. I think the white Carrot might be grown with much success on many soils, in addition to the Swede, as there is sometimes a failure in one where there may not be in the other.

GUTTA-PERCHA TUBING.—Mr. Key, of Newgate-street, stated that he had taken the earliest opportunity, as a member of the Society, of submitting to the notice of the Council an essential improvement just effected in the manufacture of elastic tubing for the purposes of raising water by suction and distributing liquid manure over the surface of land. This improvement consisted in the peculiar form given to the surface of the tubing, which, instead of being that of a revolving plane of uniform diameter, as in the case of ordinary glass or metallic tubing, was recurved throughout its length, by the introduction of a spiral process of alternate convex elevations and concave depressions. Mr. Key exhibited to the members a specimen of the plane tubing two inches in diameter and two yards long, which was found to admit of only a very slight flexure, and on being forcibly bent into a rectangular shape, it became doubled up at the angle like the inner bend of the elbow-joint, its internal diameter being considerably contracted, and its value as a conduit for liquid almost entirely destroyed. He then produced gutta-percha tubing, of the same diameter and length, but of the improved spirally-grooved shape; and this specimen, unlike the former one, was found to possess perfect flexibility and uniform curvature in every contortion to which it was subjected, leaving the internal bore of the tubing unaffected by such circumstance. Mr. Key further explained that the recurved shape of the tubing conferred upon it great power of resistance against lateral pressure; and that among the immediate purposes to which such elastic waterproof piping was applicable, he might refer to the suction and deliveries of portable manure-pumps and fire-engines. It might be made of any diameter or length, and formed in the first instance into either longitudinal or fixed angular tubes, and it admitted of being most easily repaired by a common labourer whenever a flaw was discovered or an injury sustained.—Mr. Mainwaring Paine stated that he had made trial of the principal means proposed for the suction and delivery of

liquid manure, but he had found none so effectual as those which this improvement furnished for the purposes in question; the tubes were less liable to be out of order, and when they were so the simplest application in the hands of a common workman was necessary to render them again effective. He had also found that by the application of Urwin's lift and force pump he could convert this flexible tubing into siphons, by means of which water or other liquors could easily be raised to different altitudes, or conveyed in continuous flow from a higher to a lower level over walls, turnpike roads, or other intervening eminences. The drainage from his live stock was received into tanks, and the liquid manure distributed, by tubing in lengths of 350 yards from each farm centre, over his grass, hops, and other crops.—The President remarked that every facility afforded for the distribution of liquid manure was a subject of interest and importance to the practical agriculturist.

**POULTRY DUNG.**—Mr. Tollet, of Betley Hall, Staffordshire, called the attention of the Council to the great importance of collecting and preserving the valuable manure furnished by poultry. The following is an extract from the letter with which he favoured the Council at this meeting:—

“ Keeping a large number of Cochin China Fowls, I began, in the autumn of last year, to collect the dung of my poultry yard, and am now possessed of two or three tons of it. The poultry are fed with a regular proportion of animal food, Hemp-seed also being a considerable part of their diet, together with corn of the best quality. I thought the dung produced might compete with the deposits of the sea-birds in the South Sea Islands. It is collected twice a-week, and is scoured from the wet by being put into sugar hogsheads. Being convinced of the importance of the Society's objects in endeavouring to obtain new supplies of guano, and also to discover such substitutes for it as would in a great measure render us independent of foreign supplies, I shall do everything in my power to promote these objects. I am therefore putting myself in communication with Professor Way, the consulting chemist to the Society, in order to procure an analysis of the poultry manure thus collected in my management of the Shanghai poultry. The result of this analysis will show how far this practice is likely to become a branch of our rural economy. The collection of the manure is effected at a trifling expense, and the health and cleanliness of the poultry are thereby greatly promoted.”

**WELSH FARMING.**—The Rev. Thomas Williams, of Tiry-Cwm, in Glamorganshire, having favoured the Council with various suggestions connected with the determination of prizes for the South Wales district, the following extracts from that correspondence, having a general interest connected with the ensuing Country Meeting of the Society, to be held at Gloucester, in the middle of July next, were read to the members at this weekly meeting of the Council:—

**General Character.**—South Wales labours under many disadvantages which militate against good farming as it is conducted in England and the lowlands of Scotland, among the principal of which may be cited a humid and uncertain climate, much unenclosed, common land, absenteeism, inefficient agents (who, with a few exceptions, are attorneys), and a language in which no useful knowledge is propagated. With such obstacles, it is not surprising that we are, generally speaking, very far

behind England and Scotland. The soil in most of the counties is a stiff, adhesive, and in the mineral district comprising nearly the half of South Wales, a ferruginous clay. In Brecknockshire, Monmouthshire, and part of Carmarthenshire, the old red sand-stone predominates; Cardiganshire and Radnorshire are on the slate formation. About five-sixths of the country is either mountain unenclosed or consists of hilly farms, with a right of grazing on the adjoining mountains. On the sea-coast there is a border of better land, and many districts well cultivated, the whole country being intersected by narrow valleys, the rivers and sides of which are here fertile. On account of these circumstances of a humid climate, undulating surface, with hills and valleys dotted into each other, and a stiff clay soil, I am decidedly of opinion that South Wales is eminently constituted for breeding stock and dairy farming; particularly the former, for stocking the large districts of unenclosed mountains, ranging from 1,000 to 2,500 feet above the level of the sea. Adjoining this farm, situated at an elevation of 800 feet, rises one of these ranges, which is 14 miles by 8, and highest elevation 2,600 feet; on this, to which the cattle of my farms have a right of grazing, my stock feed from the middle of April to the middle of November. I keep all the enclosed land in hay, excepting about 40 acres, which I plough for the sake of turnips and oat-straw, to help out the hay; and I force the aftergrass with manure, in order to have a good supply of grass after the stock come from the mountains.

**Cattle.**—The stock of the country is inferior to those of the three principal classes to which the Royal Agricultural Society of England gives prizes at its Annual Country Meetings; I do not think that either the Hereford or the short-horn breed flourish here as they do in more inland districts. I have observed that they all degenerate. The Devons have not had so fair a trial; but, were I to change my stock, I would prefer in this country animals of that breed to either short-horns or Herefords. There are only two local breeds of cattle in South Wales, the brown Glamorgans and the black Pembrokes. In the lowlands adjoining the coast these animals are large, with many good points, more resembling the Devons in make and character than any other cattle, and both no doubt originally derived from the same stock. Good representations of them have been given in the Farmers' Series, published by the Society for the Diffusion of Useful Knowledge. I would take the liberty of suggesting that the Royal Agricultural Society of England should encourage the improvement of these breeds. His Majesty King George the Third preferred the Glamorgans to any other cattle, and sent his bailiff every spring to select stock from them for Windsor. The farming of the country is not sufficiently advanced to support Herefords or short-horns in anything like the perfection to which they attain in England. I know, however, that it may be said, that there are Herefords in some parts of Brecknockshire equal to any animals of that breed in other parts of the kingdom: there is, indeed, on the banks of the Wye and the Usk, a small district of excellent land where first-rate cattle are bred, but I have not seen such animals anywhere else in our districts. The Glamorgans and Pembrokes have always contended for superiority, and both are favourites in the English grazing counties; the opportunity of the meeting at Gloucester might, by bringing the best animals of the two breeds into competition, decide for that occasion their respective merits. An inferior description of the same cattle is the stock of the hills, which by inferiority of keep and inclemency of climate, has degenerated from the character of the lowland cattle. I have always thought the cattle of the western highlands best suited for the mountainous districts of Wales, and I have known them to succeed in cases

where they have been tried. I would suggest a prize for the cattle best adapted for the hills of Wales, being bred in the district.

*Welsh Ponies.*—The Principality generally, and South Wales in particular, has always I believe been celebrated for its breed of ponies; and it is extraordinary that the breed has not degenerated, as no care or attention is devoted to these valuable animals. They run wild on the mountains, nobody taking the trouble to select a stallion: they take their chance. I have for some years paid much attention to the Welsh pony, being of opinion that animals of this breed will pay more on the same keep than either cattle or sheep; and no ponies can be imported from the Baltic, America, or the Mediterranean. Double the number of ponies can be kept longer on the same number of acres on the hills than in the case of cattle; there is always a ready sale, and many thousands are annually exported to other countries. A year-old pony is worth more than a yearling mountain-steer. I have given a prize, and promised to continue it for three years, at the Brecon Agricultural Society, for the best true-bred Welsh mountain pony stallion and mare. There is a great difference between a Welsh pony and a small horse; in law, anything not exceeding 13 hands high is a "pony;" but the Welsh pony is evidently a thorough-bred one, with handsome small head, clean sinewy legs, without more hair on them than an English blood-horse. A small cob, such as is called a pony in England, could not live on our hills, the steep sides of which can only be trodden securely by a genuine Welsh pony, a goat, or wild sheep; his courage and activity enable him to brave the storms, and the rugged and almost perpendicular sides of the high hills, where he is sure to be found during the summer months. The Welsh pony will become more valuable every year, as the improvement of roads has made it as easy for him to drag a farmer's wife, &c., &c., to market, as it was a few years ago for one of the plough horses to accomplish the same task. Possessing hills so extensive, and in a climate so wet and variable, where Grass flourishes, but where corn starves, this breeding of Welsh ponies, if pursued with proper and moderate attention, would form the most lucrative branch of farming in this part of the kingdom; all that is required is, a good selection of stallions and better winter keep. At present the pony only gets what he can pick up, and that is easily to be obtained in that neglected but valuable food Gorse. On one of my farms I feed every winter 40 ponies and 20 head of cattle on bruised Gorse and straw, a food which I also give instead of Oats to my cart-horses. I intend, should my life be spared, to have enough Gorse in a few years to maintain 100 ponies during the winter months. I hope that the Royal Agricultural Society of England, which has already directed public attention to this subject by its prizes for Essays on the cultivation of Gorse and machinery to effect the due bruising of the plant, will continue to encourage its cultivation; and by its prizes at Gloucester, the improvement of that most neglected but valuable animal the Welsh pony.

*Condition of Competition for Ponies.*—I beg to suggest that the prizes for ponies should be so defined that only those ponies that are bred on such high mountains as our Welsh ponies are, shall be qualified to compete. Of course, the motive for giving prizes for ponies is to encourage the breed of such animals as can support the climate, and keep in tolerable condition on heath and such coarse grasses as grow on mountains 2,000 feet above the level of the sea, and on such ground and in such a climate as deer-stalkers would expect to find a stag in the Highlands of Scotland. Unless such condition is

made, any horse—a small Arab or duodecimo Suffolk punch—can compete; and as such ponies, under certain circumstances, are in themselves valuable, the judges might award the prizes to ponies of this class, though such would in the dog-days be starved on the mountains where our Welsh mountain-ponies thrive even through the winter, excepting when the snow is too deep. All my ponies have been during the whole of last month (February) on some heath-land more than 1,000 feet above the sea, having now and then a mouthful of hay and chopped gorse supplied to them; and I have seen some of our ponies that have not been off the hills, nor had a morsel given to them, during the winter. Where Highland deer can live, so can the Welsh ponies; not so, however, can the English dwarf cobs, which, though valuable to carry an alderman of 15 or 16 stone four miles an hour, are accidental abortions. I saw one of these some time ago carrying an elderly Daniel Lambert, and of course he was worth a mint of money to such an owner; but if a stallion of that kind were offered to me gratis, I would not accept him, as I know I should be under the necessity of carrying food to him, whilst our real Welsh mountain-pony goes in search of his. In conclusion, I trust that such entries will be required as may exclude all crosses, accidental dwarf cobs, and duodecimo punches.

*Sheep.*—The Welsh farmer is fonder of his sheep than anything else; because, as he will tell you, "they give him no trouble." He turns them out on the hills in May, where they roam at pleasure. About the 20th June there is a grand day: the hills being divided by brooks into districts, on each of which there is a large fold surrounded by small ones, each owner having a right to that part of the hill who possesses one of the smaller ones; no sooner are the sheep in the large fold than every sheep-owner rushes after them, and seizes those sheep which have his own ear-mark, and throws each of them over the wall into the smaller fold, from whence they are taken to the river and washed; being shorn the next day, as the shepherds are obliged to watch these wild creatures night and day and prevent their being off, as otherwise they would assuredly be, to their accustomed haunts; when turned loose they soon find their way again to the hills. The farmers have two or three of these gatherings during the summer, and they are regarded as high holidays. There is no preparation made for the winter; nor, as the hills are generally commons, are parts preserved for the winter, as is the case in Scotland. The lambs are sent for the first winter to be wintered near the seacoast, the farmers there taking them in to graze the stubbles and ledge-banks at a charge of about 2s. 6d. each. I think it may be considered that there are only two breeds of hill sheep in Wales, namely, the Radnor Forest sheep, and that generally known as the Welsh sheep. The former is larger, has finer wool and more of it, is tamer, and requires more attention than the Welsh sheep, on which account this very good mountain sheep has not travelled southward in the Principality. Some years ago I introduced some black-faced Highland sheep into South Wales, but I found the unwillingness for change, even as I conceived for the better, too great to establish the new breed in the district. As I am myself also, I trust (although not prejudiced against improvement, from whatever quarter it may come), a true Cymro, I shall feel proud and happy to find that any suggestions of mine may have contributed to the carrying out of those objects of the Royal Agricultural Society, at its Gloucester meeting, that have special reference to the improvement of the husbandry of the Society's "South-Wales District."

*MORTALITY AMONG EWES.*—Mr. Fisher Hobbs took that opportunity of calling the attention of the members

to the extensive losses taking place during the last few weeks among the flocks of lambing ewes in Cambridgeshire and other parts of the country. He reminded the members of the veterinary privileges they enjoyed, on the one hand of making application through the Secretary, to the veterinary committee of the Society, and of the aid, on the other, they had it in their power to bestow in promoting the general good of the community by sending to the Royal Veterinary College, either alive or dead, such animals as had become affected with disease, and enabling the Professor of Cattle Pathology in that establishment to investigate more closely and satisfactorily the exact character of diseases occurring from time to time among the live-stock of farmers. The printed list of the privileges he referred to, and the schedule to be filled in on making application for professional aid, were to be obtained on addressing a letter to the Secretary of the Society. A year or two ago Mr. Hobbs's own pigs were seized with a fatal distemper, connected with ulcerated sore-throat and fever, and he believed that he should soon have lost the whole of his stock of pigs upon one farm, had it not been for the timely arrival of Professor Simonds, to whom he professionally applied under those circumstances, and who at once ascertained on the spot the cause of the malady in question, and advised such measures to be taken as prevented the further loss of a single animal. Seeing that gentleman then present, he desired to inquire of him his opinion on the nature of the prevailing malady among lambing ewes.—Professor Simonds stated that the disease to which Mr. Fisher Hobbs had alluded was dependent on atmospheric influence acting on the general functions of the body, producing unhealthy secretions, and resulting in a vitiated state of the whole mass of the blood in the system, and functional derangement of the brain; there was also a deficiency of blood, while the ewes, at the time of parturition (especially in the case of twin lambs), required not only a healthy circulating mass of such fluid, but a larger amount of it. The premonitory symptoms were—loss of appetite, diarrhoea succeeded by constipation or torpid state of the bowels, vertigo or dizziness, with that want of nervous energy which superinduced a stupidity or apathy in the animal, leading it to wander about vacantly, and only to eat its food when such was actually placed within its mouth. He recommended that the animals should be supplied with vegetables of a less succulent character than ordinary, and that an increase should be made in the use of such food as contains a large amount of nitrogenous matter, such as crushed corn and chopped hay, with a little linseed, but no bran. He pointed out the importance of careful attention being paid to the secretions of the animals, as it was through the excretory parts of the body that the disorder was most likely to be carried off. He regretted the difficulty that existed in getting farmers to supply the Royal Veterinary College with animals. He had applied to a veterinary surgeon in Norfolk to procure "subjects" for the purpose of investigation, but he had not yet been able to induce a single farmer to comply with his request. If those members of the Society who would kindly aid in these inquiries would

communicate with the College, an arrangement as to expense of carriage, keep (in the case of living animals), &c., could always be made. He further remarked that in many diseases where causes had been long in operation, immediate benefit could not be immediately expected in diminishing the extent of disease, but preventive measures might in all cases be taken, and by investigation into the cause of disease practice would be modified by an increasing knowledge of such cause. He had found the Leicester sheep bear up better against the prevailing disease than the downs, but for reasons unconnected with the circumstance of short or long wool.—Lord Ashburton expressed his willingness at once to take measures, on his own part, as well as on that of his tenants whom he hoped to induce to join with him in this important object, that Professor Simonds should be supplied with animals for the purposes of his observation and investigation.—The Hon. J. J. Carnegie, Mr. Raymond Barker, and Dr. Calvert also favoured the Council with remarks on this subject.

The Council then ordered their usual acknowledgments for the various communications submitted to them at that meeting; and adjourned to 12 o'clock on Wednesday next, when Professor Way would deliver before them and such other members of the Society as would favour them with their attendance, his lecture on recent discoveries connected with the absorption of ammonia by certain mineral substances.

#### NEW MEMBERS.

The Earl Somers, of Eastnor Castle, Herefordshire, was elected a Governor of the Society.

The following new Members were elected:—

Washbourn, William, Mayor of Gloucester  
 Collins, Henry, Duffryn, Newport, Monmouthshire  
 Fawcett, H. H. Tudar Villas, Peckham, Surrey  
 Hopper, William Cuthbert, Rectory, Wells, Norfolk  
 Walker, D. M., Gloucester  
 Evans, John, Altycaadno, Carmarthen  
 Colhn, George, Nettswell Bury, Harlow, Essex  
 Walker, George, Newbold Grange, Rugby, Warwickshire  
 Downing, John, Gloucester  
 Perry, Frederick Charles, Dunston, Penkridge, Staffordshire  
 Watton, George B., the Hall Farm, Longdon, Shrewsbury  
 Stedman, William, Bedston Hall, Ludlow, Salop  
 Brice, Samuel B. R., Spain's Hall, Finchingfield, Essex  
 Kendall, John, Gloucester  
 Wilson, Edward B., Poet's Corner, Westminster  
 Crompton, George, Drayton Grove, Old Brompton  
 Paterson, Richard, Leesons, Chiselhurst, Kent  
 Young, George, 27, Mark Lane, London  
 Whitear, R. B., Martyr-Worthy, Winchester  
 Williams, Edward, Celyn, Northop, Flintshire  
 Ferrabee, James, Phenix Iron Works, Stroud  
 Crump, Joseph, Woolershill, Tewkesbury, Gloucestershire  
 Wilson, William, Ashbocking, Ipswich, Suffolk  
 Morley, John, Broughton Lodge, Manchester  
 Impey, Robert, Street, Glastonbury, Somerset  
 Heath, Douglas Denon, Kitlands, Dorking, Surrey  
 Milward, Rev. Henry, Paulton Vicarage, Bristol  
 Ferrabee, Henry, Phenix Iron Works, Stroud  
 Snowdon, Thomas, Middlesborough-on-Tees, Durham  
 Reed, J., Uckington, Cheltenham, Gloucestershire  
 Knowles, James, Earl's Court, Old Brompton  
 Maude, William Edward, Harrington Street, Liverpool  
 Peile, Thomas Williamson, Repton School, Staffordshire  
 David, Edward, Fairwater House, Cardiff, Glamorganshire  
 Forde, Matthew, Manor House, Maghull, Ormskirk  
 Jones, E. J., Brainton, Hereford

Gillett, Thomas, Kilkenny, Witney, Oxon  
 Cater, J. W., West Lodge, Barnet, Hertfordshire  
 Cuff, J. H., 10, Smithfield Market, London  
 Fawcett, A., Riggsvilla, Killucan, Ireland  
 Evans, E., Middleton, Llwynbarried, Rhayader, Radnorshire  
 Lawrence, Thomas, Churchdown, Gloucester  
 Humphrey, Thomas, Pershore, Worcestershire  
 Calthorp, John, Stanhoe Hall, Rougham, Norfolk  
 Bowly, Samuel, Gloucester  
 Stenart, William, jun., Kempston, Bedford  
 Duncalf, G. H., Newport, Salop  
 Perry, William, Cholstry, Leominster  
 Blake, Ethelstone H., Remyle, Letterfrack, County Galway  
 Darby, Abraham, High Sheriff of the County of Bucks  
 Hughes, Hugh, Kinnell Park, Denbigh  
 Humberston, Philip, Stapleton, Chester  
 Lea, John Wheeley, Worcester  
 Whitehead, Jeffery, R. A. College, Cirencester  
 Furniss, Edward, jun., Endecliffe Place, Sheffield.

At the WEEKLY COUNCIL, held on Wednesday, March 16, Lord Ashburton, President, in the chair, Professor Way, the Consulting-Chemist of the Society, delivered before the Governors and Members his lecture on the discovery of a natural source of "soluble silica," on the property of Mr. Wainwaring Paine, at Farnham, in Surrey, and of its agricultural application in reference to Professor Way's former investigations and deductions, as published in the *Journal* of the Society. Remarks on points connected with this discovery were offered to the Meeting by Lord Ashburton, Colonel Challoner, Colonel Le Couteur, Mr. Paine, Mr. Nesbit, Mr. Rowlandson, and Dr. Calvert.

At the request of the *Journal* Committee, Professor Way was desired to prepare, with as little loss of time as possible, a complete detail of the facts and bearings of this discovery, in order that it might at once be printed for the information of the Members in the *Journal* of the Society, which would this half year be brought out at an earlier date than usual. The thanks of the meeting were then moved by Lord Camoys, seconded by Col. Challoner, and passed unanimously, to Professor Way and Mr. Wainwaring Paine, for the kind trouble they had taken in bringing this subject before the Society.

On the motion of Mr. Raymond Barker, seconded by Col. Challoner, the Meetings of the Council were adjourned, over Easter, to Wednesday, April 6th.

## CORNISH POTATO CULTURE.

The cultivation of this root forms a very considerable part of the business of farmers in some districts, particularly those residing at Penzance, the Lizard, and on the banks of the Looe and Tamar. The soil and climate of Cornwall are peculiarly adapted to the growth of the potato, the land being generally dry, light, and friable, and the climate moist and mild. An old lay pasture is preferred, which is well reduced by ploughing, tormenting, harrowing, and rolling, until it is brought to a fine tilth; it is then manured with dung or seaweed, and latterly guano. This crop being generally considered to be a fallow crop, most farmers pay considerable attention to the weeding, hoeing, and hanking. The kinds of potatoes are numerous, but their names being provincial would not be known in other localities; we have, however, two kinds which are known in the London market by the names of the 'Cornish Reds' and the 'Early Kidney.' The cultivation of the last kind is exclusively confined to the Penzance district, and they are raised sufficiently early to compete with the forced potatoes of the London market. From 12,000 to 15,000 bushels of the early kidneys are sent annually to the eastern markets.

In the parishes bordering on the Looe great quantities of potatoes are grown for the London market. In some of the parishes which adjoin the cliffs and the river, where seaweed can be obtained at a small expense, the greater portion of the land intended for a wheat crop is first planted to potatoes. The preparation for the last-named crop commences in the months of January and February, by carting out the accumulated soil from the hedges into small heaps: if this should not prove sufficient, furrows are ploughed up across the field, and the soil also added to that which the hedge grips produced. On these 'bottoms' of earth, dung from the farm-yard, seaweed, and sand are deposited and mixed together. The quantity of dung and weed amounts generally to about 25 cart loads per acre; sand from 12 to 14 loads. The lay is then partly skimmed, the one portion being turned over on that which remains, and is called 'turning to rot.' After it has been 'to rot' for two or three months, it is harrowed down fine, and if any couch appears it is burned; but burning is not generally liked for potatoes, it being considered that the ashes cause the potato to be of a *soapy* close nature. The manure is spread as the potatoes are planted, which is done by ploughing a furrow, into which the sets are dropped by women and children. A man follows, and pushes in the manure on the sets with the back of a rake; the plough returns, and covers the whole with another furrow. Two small furrows are then ploughed without any sets, which gives place sufficient between the rows of potatoes. When the field, or a given portion thereof, is planted, the land is harrowed down fine, which completes the work. The potatoes are taken up as soon as they are ripe, by men, women, and boys, with an implement called the 'digger,' having three prongs like a dung fork, only turned downwards instead of looking forward, as those of that implement. The price for 'digging' the potatoes varies from 15s. to 20s. an acre, the produce averaging from 240 to 300 Winchester bushels of 8 gallons per acre, which in the season will fetch at the ship's side from £18 to £20 per acre. As soon as the land is clean of potatoes the wheat is sown, after which a barley crop too often follows, without any other manure being applied to the land than that for the potato crop. The potato tillage is an enticing one at first view, promising as it does a fair profit; but since no manure is made by the crop, no portion of it being consumed on the farm, there is no provision made for another year's cropping beyond the seaweed occasionally to be obtained at the seaside.

Of the Early Kidney the planting commences the latter end of October, and continues until Christmas. Lay is best adapted for the purpose, which is turned down in a peculiar manner by hand labour, and a good tilth obtained on the surface by the dexterous hand of the workman. The manure used is generally seaweed. The 'sets' are placed in the drill, a little earth thrown on them, and the seaweed placed over the whole. A better plan is to place a little rotten stable dung between the earth and seaweed. The early potatoes are not banked-up, but merely hoed, and this not after the middle of March. They are grown on the growan (granite) soils, but the most extensive breadth is on the greenstone rocks, where they intersect the slate in the fine sheltered districts near Penzance; 1000 acres of which, it is said, yield a rental of £10,000.

A few of the potatoes are taken up early in April, and these are worth 1s. 3d. per lb. on the spot (occasionally 2s. 6d. per lb.) These are not obtained by digging up the entire plant, but by carefully examining the root with the hand, and pulling off such tubers as may be sufficiently large: the root is then covered up again. The potatoes are full grown about the middle of May. — *Journal of the Royal Agricultural Society of England.*

## SEED TIME.

The pulse of the country begins to beat high on the subject of seed-time—a season second to none in the calendar in point of interest, harvest expected—and from the dependence of a bountiful harvest itself upon a propitious seed-time, it were difficult to say which of the two is often the most exciting to the farmer; for Winter never departs the country without leaving behind him his own dark train of consequences, involving agriculture in many trying difficulties, out of which it requires no ordinary amount of ingenuity to extricate herself; and the winter just gone has left an unusually long train, owing to the heavy inundations experienced since autumn. Fickle Spring, with her thousand characteristic vicissitudes, is, at the moment we are writing, whispering into the ear hopes and fears with an importunate degree of rapidity, so embarrassing as to baffle the most energetic mind from arriving at practical conclusions. Heavy rains consolidate the ground. Ground so consolidated excludes the free circulation of the atmosphere from conveying to the roots of plants moisture and its soothing influence over night during the burning months of summer; hence, both plants, and the soil on which they grow, become parched. Mildew follows, with a sad succession of insects, nursing their devastating swarms. But it were an endless task to enumerate the grievances of the farmer thus standing, as it were, in his barn-door, with his sacks of well-selected seed, ready for sowing, behind him, his hands thrust to the bottom of his vest pockets, with a troubled eye surveying the contending elements of heaven, as they angrily sweep in voluminous masses from one side of the hemisphere to the other, in adverse and opposite directions, as we have stood many an anxious day. But there is no finding time and the seasons thus standing still; for they roll on, alike regardless of the weather as of the hopes and fears of the farmer, and now demand that every province in the kingdom take up the subject of seed-time as a practical question. For both ends of the day are fast stretching out in length; birds are beginning to sing, buds to expand and blossom, lambs to dance, while dry and well-drained soils are becoming more and more inviting, and in many of our southern provinces have called forth the sower; and when once begun, the tidings of seed-time fly like good news along the wires of the telegraph faster than time itself, diffusing its emulous spirit in rural districts.

A dry seed bed is one of the cardinal points in successful practice—well worth the waiting for eight or ten days, if it were only certain at the expiration of such period; but in this lies one of the greatest perplexities of the farmer, for eight or ten days behind is often half a crop lost. Hence the well-known maxim—“Never lose a sowing-tid when once it has been got”—a maxim which has been carried so far, that we have known some old-school folks begin to sow on a certain day, if fair above, let the season below be what it may. Both

the extremes—of waiting too long for a good tilth, and sowing too soon in a bad one—are equally reprehensible; the grand question being to catch the golden mean between the two.

Much depends upon the weather immediately after sowing. If the ground has been sufficiently dry to carry the teams without poaching or puddling it, and if sowing is succeeded by a few days of fine weather, so as to afford the heat of the sun and influence of the atmosphere time to neutralize that peculiar adhesiveness of the particles of the generality of soils so well known to farmers when fresh harrowed, and also to allow those particles time to settle among themselves in a sufficiently porous state, so as to admit of the phenomenon of evaporation without cracking, and the free and healthy circulation of the atmosphere among the expanding roots of plants, carrying off at the same time their insensible perspiration, containing gases noxious to vitality when confined, in the same manner as we ourselves experience a confined atmosphere to breathe in—if these conditions, we say, are realized, then an ordinary dry bed for the seed may not unfrequently be found more propitious than the driest and finest one, when succeeded by heavy rains immediately after the seed has been placed in it; for the injurious effects of such, and consequences following, are well known. Numerous instances have occurred, where newly-sown barley and other spring crops on heavy clay lands, thus overtaken by rain, have been reploughed and sown a second time; and we have known occasions of a third sowing—for all the extra expense of seed and labour—turn out a more profitable crop than that on fields of equal quality of soils only sown once.

Some soils acquire a degree of acidity, if allowed to be but a very short time in a consolidated and moist state. Hence the *rationale* of spring-fallowing by ploughing, harrowing, rolling, &c., as the ground requires, so as to bring it to a healthy state by neutralizing its acidity, acquired during winter or since last exposed to the influence of the sun and atmosphere. Hence, also, the *rationale* of the practice of not breaking heavy clay-lands to a very fine mould, by rolling and clod-crushing, for spring corn crops, but of leaving them in a state of disintegration more like road metal than fine garden-mould, because that, when left in this state, they are found not to run together so easily as when broken down and pulverized more finely; while, on the contrary, they are less liable to crack and suffer from drought during the scorching months of summer.

The fecundity of the harvest-field is greatly dependent upon the healthy state of the plants during their infancy, such as wheat-corn, for instance; for the ears of wheat are very early developed in embryo, and, unless the plant receives an ample supply of the daily necessities of life, and is otherwise fostered according to its early wants at this pe-

riod of life, maturity can never be expected, for the harvest-field not unfrequently yields many more empty grains than full ones in every ear, while many ears as often return little but chaff. Autumn-sown corn may lie for the winter months in an inactive state, making no progress in growth; but after this season of the year arrives, there is no staying the progress of Nature, for onward she will move for harvest, with a firmness of step and determination peculiar to herself, performing with undeviating purpose the providence of the Great Ruler of all things. Farmers may dream of fine to-morrows and sunny harvest-scenes; but the present is her time, and she never allows it to pass unembraced. If, on the other hand, the plant receives an ample supply of food, and is successfully attended to, at this early period of growth, harvest will not only present full ears, but an abundant supply of them, the soil having tillered in the most prolific manner.

Of all our modern improvements, that of thorough draining is perhaps the most important in seed-time; not merely because superfluous water is removed from the soil, carrying with it acidulous matter injurious to vegetation, but also because it admits of the successful introduction of different and cheaper modes of culture. For instance, the use of the grubber and scarifier has almost superseded the old practice of spring fallowing by frequent ploughings, rolling and harrowing, and, in many cases, summer fallowing itself; the heaviest clays, in the latter case, growing fine swedes and mangold. We know some heavy clay farms where six horses, with the aid of a steam-engine for thrashing, do the work better than ten horses formerly did—a saving of labour, tear and wear, in horses and keep, of no mean importance, to say nothing of the difference in the value of the crops. Farmers have long been familiar with the fact, that when winter frosts pierce to any great depth in the soil, one good crop may be had after autumn ploughing only a stubble furrow, and even after turnips without ploughing at all—harrowing the loose surface soil created by the frost being all that is necessary; but, in these cases, the subsequent crops never turned out so favourably, unless the lands were fallowed the next year. Artificial grasses, for example, and crop succeeding them in the ordinary four-course shift, never did well; consequently, the system was condemned as an exhausting one, because the acidity of the soil could not be counteracted under it, even when the crop after the grasses was followed by an expensive summer fallow; but thorough draining has triumphed over all these difficulties by the removal of acid matter, and the consequent result produced of a radical change in the constitution of the soil, so that it can now be worked successfully by the scarifier leaving the fine mould created on the surface by the frost of winter fit for the growth of mangold-wurzel and swedes. If the scarifier is kept going so as thoroughly to loosen and break the bottom soil when “between the wet and the dry,” as it is sometimes provincially termed, the whole soil may be brought to a fine turnip tilth; more moisture may be retained in it for starting vegetation than could have been got under the old system in dry years—a re-

sult not the least important in the art of successful turnip growing. A heavy crop of roots may also be got, instead of naked fallow; and the land in autumn, when those are harvested, may be left in a better state for wheat or other crop—the differences incalculable in value. From time immemorial the Chinese have been in the practice of subsoiling and cultivating the finely-pulverized surface soil with the hoe; the principal feature in their agriculture, which has gained for it three-fourths of all the merit it possesses; a practice, although rudely carried out, and defective for the want of drainage on many soils, is yet based upon sound principles; illustrating, in a very forcible manner, the value of a solid foundation to successful agriculture. One peculiar advantage of the surface system is that the fine particles of earth are not so liable to run together after heavy showers of rain, but always form a sweet and healthy seed bed for all kinds of grain.

Heavy crops may be got, under the surface system, from soils of a very sterile and unsound character, if a liberal application of manure is properly incorporated with a few inches of the surface soil, when otherwise little could be reaped but weeds in harvest. The following example will illustrate this proposition:—

A field of about 33 acres of level alluvial soil, unsound in quality from the presence of some deleterious acid substances in it, was laid down in turnips in 1840. The land was undrained, burnt up in summer, but very wet during winter; and as soon as sheep could be placed upon it, in spring 1841, the whole crop—rather a light one—was eaten off the ground. Previous to the sheep being put upon it there was a fine mould for a few inches in depth over the surface, and the effect of the trampling their droppings in it was to consolidate the whole like a malt floor, conferring upon the field a very unpromising appearance, which made both the servants on the farm, as well as the neighbouring farmers, smile at the new-fangled system thus introduced by a scientific and practical man from the south, on a soil liable to be rent in fissures, and literally burnt into bricks during summer. The adjoining farmer was even so taken by surprise as to discredit the statement of his servants, and consequently after night-fall visited the field then being ploughed, to satisfy himself if his neighbour was in reality *compos mentis* or not. His neighbour, however, was always more than able to defend himself, so that as yet none ventured to call his practice in question, for fear of getting across the fingers. Moreover, one thing deserving of special notice was somewhat in his favour; for three-fourths of the field had hitherto never yielded anything in harvest but sow-thistles for corn—a change which norland farmers did not like any more than southern. It grew turnips and other green crops, but corn “segged.” But although the treading of the sheep consolidated the whole, so that the ground rung below the foot, so to speak, like rock, yet the mixture of fine mould and droppings was easily separated from that on which it was incumbent by the plough, in cakes of about an inch in thickness, and the whole field was ploughed this depth, the ploughs keeping close up to the sheep nets. When

newly ploughed the field had certainly rather a forbidding appearance—enough to startle honest rusticity—for the cakes split like ice, bounding from the share and mouldboard in all positions, some being turned over flat, and others standing on their edges at various angles with the surface. The cakes themselves, however, had a healthy appearance, while they were evidently subject to the roller and harrows. The whole field was sown with barley, broadcast, which came away beautifully, turning out the most prolific crop in the district; exemplifying, in a very forcible manner, the truth of the proposition above enunciated.

The case of the ploughman ought never to be overlooked in seed-time, for invariably he encounters either stones, clods, dust, or adhesive soils. Plodding after the harrows among tenacious clays

in bad weather is no joke. Those of our readers who have seen the American walking along the ceiling of the room with his head downwards, and who understand the difficulties which Yankee has to overcome, may form a tolerably good idea of the position of the ploughman. The pressure of the atmosphere is equal in both cases, other things being equal; and other things this year are not so different as farmers would wish. There is no one has more reason to hail the many blessings which thorough drainage and fine weather confer upon the seed time than the honest, plodding, industrious rustic behind the harrows. Those who behold him urging on his team, if they cannot acquiesce in the soundness of our conclusion, have only to join him for a single yoking, when they will fairly comprehend it.

## THE STATISTICS OF AGRICULTURE.

BY A PRACTICAL FARMER.

ON THE IMPORTANCE OF COLLECTING THE AGRICULTURAL STATISTICS OF GREAT BRITAIN AND IRELAND, AND THEIR GREAT VALUE IN REGULATING AND EQUALISING THE MARKETS OF EUROPE AND AMERICA.

The *Mark Lane Express* has hitherto wisely abstained from the discussion of general politics, but it has with its best energies, judgment, and ability continually advocated and strenuously aided in carrying out that line of politics (agricultural politics) which tended most to uphold and advance the prosperity of British agriculture; and its pages are ever open to suggestions, having for their object its improvement and progress. Having this in view, we wish to say a few words upon the importance of collecting the statistics of British agriculture.

The British empire is unquestionably at the head of the nations of the earth. It stands pre-eminently above all others in many ways; but for our present purpose we only take the pre-eminence of the mother countries, Great Britain and Ireland, and we say they are first in their agriculture, first in their manufactures, their trade, and their commerce. These latter are in a great measure guided, and their prosperity advanced, by a system of statistics founded and upheld for their benefit; but agriculture is left entirely to its own resources. To us it does seem peculiarly strange and inconsistent that a country so great in its agriculture as to command the direction of the markets of the world, should be without adequate information on this point. We have a large population unceasingly engaged in enhancing the country's greatness by indefatigable industry and perseverance; but we are without any correct knowledge of the means by which the population is to be fed, and we know but little in reality of the probable amount of food produced for its support. To carry out this principle in private life would be most inconsistent: every head of a family is necessitated to look to his means of support, and arrange his affairs accordingly. The inhabitants of this country are but as one large family, and their requirements ought to be ascertained and provided for in the surest and best way.

Statistical information of various kinds are collected for the regulation of other matters. Statistics of railway travelling and of accidents; statistics of education, of criminals, lunacy, condition of the poor, births, marriages, deaths—of postage, duration of life, yes, even to drunkenness: these are known, and many others; and yet that which is of far greater importance—the resources of the nation in its supply of food for the support of the people of these kingdoms is almost unknown. It is so neglected that but a very imperfect knowledge indeed is obtained, and that knowledge often leading to great errors, and the most fearful results: as in Ireland, in 1846-7, when thousands upon thousands perished! One trembles at the thought. This ought not to be.

It behoves our legislators to look well to these things. It is a fearful thing to throw away human life through ignorance. What a wonderful advantage this knowledge would have been to the Irish population of those years, had any fair account of the corn and potato crops been taken, and the probable deficiency estimated. What timely provision might have been made—what suffering and death averted! It is imperatively the duty of Government to ascertain the probable amount of food produced annually in this country; it is the store for the yearly wants of the people. It is also indispensably requisite for the guidance of all parties engaged in those trades which provide food for the people; it will rule their business transactions; it will tend much towards equalizing prices throughout the year; it will guide the producer and consumer, the buyer and seller; merchants and dealers would be more surely guided; the markets would be supplied with more regularity. The requirements of the country being known throughout the world, provision to meet it would soon become a customary business in different quarters of the globe, and be acted upon according to their facili-



ties of transit. The home supply would at all times suffice for the winter and spring months, the continent would first follow, and America conclude the year. These, again, would be guided by a knowledge of our wants. If the British crops are good and plentiful, our wants will be trifling, and in such proportion will they be supplied: absence of demand here will drive our usual supplies to other markets, and in this way, too, our markets will be further regulated, and prices rendered more equable and assimilating.

There is no reason why such great fluctuations in the price of corn should so continually occur as is the case now. It is mainly attributable to the absence of correct information. At present all are in ignorance, all act in ignorance, all are alike speculators; and this speculation is continual. No one pretends to know what supplies are to come in—there is no certainty in the corn trade—merchants, millers, farmers, dealers, are alike ignorant, and buy and sell in ignorance of the actual state of the home supplies. Everybody acts in accordance with their own impressions or necessities—the rich keep and the needy sell, both in ignorance: but let the probable produce of the country be fairly ascertained and condensed into a tabular form, and diffused, it becomes an admitted truth by which all may in some measure be guided—a degree of stability and certainty is given to the trade—there are data upon which to act—and not merely the markets of this country are influenced, but those in every country usually contributing to supply us. That eminent American statesman, the late Daniel Webster, in the course of the splendid speech he delivered at the meeting of the Royal Agricultural Society of England, at Oxford, said, “That the variation of a single shilling in the price of a quarter of Wheat in England was felt on the western shores of the great Atlantic, and had a sensible influence in the far far west of America and every quarter of the world.” If such is the rule which Great Britain has over the markets of the world, what a forcible argument is it to induce her by every possible means to attempt its safe and better regulation!

This is further urged upon us when we consider the astonishing facilities afforded for communication by the electric telegraph. The state of markets here will soon be made known to the chief towns of Europe during the very hours of business—Mark-lane prices known at Paris, Paris prices known at Mark-lane, all in the same hour. This, under a free-trade economy, is no small thing; it is of vast importance. The markets of Europe will be regulated daily by British prices, and the great basis upon which this is founded is the knowledge of the state and prospects of the British farmer.

Prices here are again ruled by our facilities of railway traffic. No sooner is a demand created than it is met; country merchants from distant districts constantly attend the leading markets, and take instant advantage of any favourable change, however slight. This of itself regulates the market to a certain extent. The same remarks will apply to the meat and wool trades. The English farmers are now pretty generally turning their atten-

tion to the production of meat and wool, as for the present being more profitable than grain; but to proceed in utter ignorance of the quantity produced, or likely to be produced, will render these trades as uncertain as that in corn. The great probability is that in a very few years, if we continue in ignorance, this extended attempt to increase the supply of the animal food of the country will prove very unprofitable; but if a yearly account is taken, the rate of increase will soon be shown, and by this will they be guided, the trade rendered safe and stable, and the same influence will be exerted on the production of animal food throughout the continent as in that of grain. All will be regulated by the British market, and that market based upon correct information as to the supply necessary for the wants of the British public.

We need not stay to point out the way to collect this information, the means are so ample. The “machinery” only requires to be put in motion; to us it is immaterial. Mr. Milner Gibson’s plan of 1847 is good—viz., through the registrars of the poor-law unions, by means of printed forms, &c., filled up by occupiers; county returns are suggested through an appointed officer, aided by the usual parochial officers; the board of guardians, others say, would do well; district enumerators, say others, at a price for each return; and many, many more schemes have we seen. *What is done in India, in America, in France, in Holland, in Belgium, and elsewhere, can be done in Great Britain.*

#### PREPARATION OF FOOD FOR STOCK.

SIR,—I am much indebted to Mr. Baker, of Writtle, and “Safe Progress,” for replies to my inquiry respecting a machine for preparing roots for mixing with hay or straw chaff, &c., as food for stock. I am not at all sceptical as to the merits of the system itself, but on the contrary have a strong opinion in its favour. But I confess I am a little sceptical as to the advantage which the machines possess that are respectively recommended by Mr. Baker and “Safe Progress,” and which, as I am given to understand, “pluck” or tear the roots into pieces from the size of a bean to an egg; but whether a sparrow’s or a pigeon’s egg I am not informed.

I believe there are at least four machines which have been publicly recommended, for the purpose of preparing roots for mixing with dry chaff; namely, Mr. Baker’s, which “plucks” the roots in irregular shaped pieces, from the size of an egg downwards; Mr. Harwood’s, of Stonham, made by Ransome and Sims, which cuts into pieces the size of a bean; Mr. Bush’s, of Glencairn, Lismore, Ireland, which cuts in slices half-an-inch wide and the thickness of a shilling; and Moody’s cutter, which cuts into strips, by means of gouge-shaped knives,  $\frac{1}{2}$  of an inch wide by  $\frac{1}{4}$  to  $\frac{1}{2}$  inch in thickness, and manufactured by Carson, of Warminster. Now not having proved the value of either of the above machines practically, and being anxious to introduce on my farm, the machine that would best answer the purpose intended, which I take to be that which will best prepare the roots for *intimate admixture* with dry chaff, I shall esteem it a favour if either of your correspondents will favour me with the advantages they obtain in practice, in the use of machines which “pluck” the roots into irregular pieces, to other machines which cut into thin narrow slips, with almost mathematical correctness.

I am, Mr. Editor, yours faithfully,

Vale of Kennett, March 16th.

CULTIVATOR.

## ON THE NECESSITY OF A MORE INTIMATE CONNEXION BETWEEN THE LONDON AND LOCAL FARMERS' CLUBS.

TO THE CHAIRMEN, VICE-CHAIRMEN, SECRETARIES, AND OTHER MEMBERS OF THE LOCAL FARMERS' CLUBS THROUGHOUT THE UNITED KINGDOM.

GENTLEMEN,—I make no apology for addressing you in the present position of our affairs, but proceed at once to the undertaking.

When it became apparent—through the medium of Mr. Young's letter to his Grace the Duke of Richmond—that the dissolution of the National Association was at hand, expressions loud and deep were heard, that a rallying point in London for agriculturists would be greatly required.

Participating in this view myself, I ventured, on Monday, the 7th February—in the course of introducing the subject for that evening's discussion, at the London Farmers' Club—to bring the question prominently before the meeting, by recommending, in connection with agricultural statistics, the re-establishment of the Board of Agriculture, believing that such an institution would form an efficient link between agriculturists and the legislature.

I was, moreover, actuated by a desire to see the still important interests of agriculture emancipated from the thralldom of the Board of Trade.

I am, however, bound to confess, that although the gentlemen present (I believe unanimously) admitted that a common centre—where the influence and power of the whole agricultural body would be united in one bond—would be of incalculable benefit, yet they doubted the propriety of resuscitating the Board of Agriculture, but thought the London Farmers' Club, in connexion with the local clubs, would form the best basis for that purpose.

Seeing so large a majority, comprising much influence, talent, and experience, so decidedly in favour of the latter proposition, I at once conceded my own opinion, and have with much cordiality adopted what appeared to be the wish of others: and it is on this important question—the union of farmers' clubs—that I now address you.

It is, I imagine, quite unnecessary to point out to you that commercial men of all grades have their Chambers of Commerce, &c., and shipowners their associations, where are discussed, not only questions of practical utility connected with their respective professions, but politics, both general and local; whilst agriculturists have only their Agricultural Associations with their annual, and Farmers' Clubs with their quarterly, or, at the most, monthly meetings during the winter season, where politics of all descriptions are most scrupulously prohibited by a stringent rule, although I admit that of late I have been delighted to witness the violation of those absurd restrictions.

And why this exclusion of all political subjects?

Surely it cannot be argued that farmers in the middle of the nineteenth century are too ignorant to understand their own position, or to comprehend

political questions which bear on their own interests?

In my judgment, then, the sooner such vexatious rules, as regards *agricultural* politics at least, are expunged, the better.

Apologising for this digression into which I have been betrayed, allow me, as a very humble but ardent advocate for concentrating our forces, to impress upon you the absolute necessity of at once adopting such measures as will facilitate our perfect combination; and for carrying this scheme into successful operation, the union of the London and local farmers' clubs appears to offer the most efficient means.

I certainly do labour under a deeply-rooted conviction that the benefits which might be expected to flow from such an arrangement, if energetically carried into effect, would be manifold and important. Permit me here to state that the Winchester and the Bodley and South Hants Farmers' Clubs are each taking steps to effect an union with the London Farmers' Club; for without combination no effective co-operation can ever be accomplished.

In January, 1847, the London Farmers' Club issued circulars to all the local clubs, proposing a more "intimate connexion," and prescribing rules for carrying that project into execution, to which I beg to draw your especial attention.

For the information, however, of such as are unacquainted with their provisions, I will transcribe the rules of admission *verbatim*:

(COPY.)

First—That every club paying the annual subscription of one guinea, with the entrance-fee of another guinea on joining, have the right of deputation any one of its members to attend all or any of our discussion meetings; the said member having for the time all the privileges of an actual member of the club.

Second—That, to prevent confusion, and the admission of persons not entitled, the member to be deputed be chosen at an authorized meeting of your club, and that his name and address be sent to me by the secretary previous to the day upon which our discussion takes place.

HENRY CORBET,

London Farmers' Club.

Secretary.

Although I am addressing you entirely on my own responsibility, yet I beg to state that the resolution of the London club, proposing the admission of deputies from the local clubs, stands in full efficiency, and that the members generally would hail with satisfaction the prospect of a more "intimate connexion," cannot for one moment be doubted.

One of the most important results of this union would be, that it would form the most effectual means of any at present in existence of ascertaining the opinion of the whole agricultural body upon any question at issue, and of which M.P.'s might with propriety avail themselves.

And might it not form the most efficient machinery for collecting agricultural statistics, believing that some of the most practical and intelligent farmers are generally connected with farmers' clubs?

Whilst I am very desirous to establish this project, and most emphatically call upon all true friends of the cultivators of the soil to assist in the movement, yet, believe me, I should be one of the last persons in the world to advocate a step which

would lead to the conversion of farmers' clubs into political unions.

Feeling that I may with safety leave this question in your hands, I am, gentlemen, with unfeigned respect, and best wishes for the cause I so ardently espouse,

Your very faithful and obedient servant,  
SAMUEL CHEETHAM.

Totton, Southampton,  
March 1st, 1853.

## W A G E S .

It may not be known to many of my readers that within the past month there has been a strike amongst the labourers of Wiltshire. Although by no means partial to such disturbances to the equilibrium of trade, I can perceive that at times they are very significant. If farmers in some quarters combine to underpay their labourers, the labourers may naturally enough be expected likewise combining to refuse to work upon other than fair terms. If it is expected that a man, with a wife and children to maintain, can do so in an honest manner upon 7s. per week, the farmers must surely be chargeable with either culpable neglect, or reckless indifference. They have either not sufficiently regarded the circumstances of their labourers, or they have been very careless about them.

There is a theory abroad in some quarters, to the effect that *the interest of the master is the interest of the servant, and that the interest of the servant is the interest of the master*, and we have heard as a sentiment for after-dinner discussion that "Property has its duties as well as its rights." These are very pleasant matters to think and talk about. They serve to bring friends together, and to elicit an immense amount of latent benevolence of language. Practically they are too often but mere myths. The fear that they would lead men from their legitimate station, and break down the barriers that separate the classes, is not unfrequently expressed. There are exceptions to the rule, and I would that these exceptions might become the rule: ours might then justly claim the designation of golden days.

But the Wiltshire farmers — could they be blamed? Did they not obey the economical law in paying no more than the labour they required was worth in the market? They could obtain men of all kinds for 1s. 2d. a day: why should they give 1s. 6d. or 1s. 8d.? Yes, why? There is no reason, save the labourer's refusal to work, that should cause the farmer to increase the rate of wages, unless he is a man with a simply human heart, and humane feelings. In this case he will probably think of diminished strength and lowered morals; and provided he is a wise man, he will consider the ill consequences of such a state of things upon cultivation.

The labourers in question "demand a rise of 2s. per week — from 7s. to 9s. — together with the significant and encouraging request that their wages

shall be paid on a Friday, instead of a Saturday night."

To adhere to a rate of wages now, that was not thought exorbitant three years ago, is absolutely unfair: and I must say that I sympathise with the men who resist the endeavour. It is the more unfair if the rate of wages bear any near relation to the price of produce, because the price of the staple produce of our farms has certainly increased. But it does not wholly depend upon this cause. Supply and demand are now the regulating principle, and the effect of this principle has been much more apparent since the encouragement of manufacture and the time of the Modern Exodus.

In the map which Mr. Caird prefixes to his work, entitled "English Agriculture," we are astonished to find a wages division line running from east to west, and cutting our island into two distinct portions; the one being characterized by a low, and the other by a high rate of wages. This line curtails Lincolnshire, halves Leicestershire, beheads Warwickshire, cuts Shropshire in twain, and loses itself in the Irish Channel. The average of the counties north of this line is 37 per cent. higher than those to the south. For the sake of clearness, I give the averages thus —

Average of all northern counties . . . . .	11s. 6d.
Average of all southern counties . . . . .	8s. 5d.
Average of the whole . . . . .	9s. 6d.

Now what does this difference between north and south mean? It means that there is a greater demand for labour in the north than in the south. And the reason of this? It lies in the fact of the stimulus given to labour, by manufacturing, and mining enterprise. These districts have absorbed an immense amount of labour from the agricultural districts, and offer advantages to the families of those who are now starving in Wiltshire, Dorset, and elsewhere, *which the law of settlement prevents them from accepting*. In the absence of agricultural statistics, likewise, this truth is not known; and if it were published the labourers would be little the wiser, because many of them cannot read!

In 1770 the price of labour in Cumberland was 6s. 6d., in the West Riding 6s., in Lancashire 6s. 6d., in each of which counties it has increased fully 100 per cent.; while the increase in the southern counties, mentioned by Young, is under 14 per cent. The average wages in 1770, in the northern

counties visited by Young, were 6s. 9d., and of the southern counties 7s. 6d.

Manufacturing and mining enterprise is clearly in favour of the farm labourer, and, upon a common sense view of the matter, I should conclude of the farmer also.

It will be as well to look at the effect this low wage system has upon the labourer with respect to his work.

*It is sufficiently evident, without the aid of medical or other statistics, that a man with children dependent upon him, earning 7s. a week, cannot live.* He may exist, but he cannot live: I mean that he is not in a fit state to perform the functions and duties proper to life. His physical, mental, spiritual, moral ability—all is stunted. A feeble mind within a feeble body, it is impossible that he can work well. Probably he does his best: but what a meagre thing is *best* under such circumstances! Look at the evidence contained in the "Report on the Employment of Women and Children in Agriculture" which will throw a useful light here. Dr. Greenup, M.D., when examined before the committee, says, in answer to the question whether the work is detrimental to health, "Not at all. Here the poor do not suffer from work; the diseases I see arise almost all from want of proper food and clothing. Four out of five who apply to me suffer from complaints traceable to their food being insufficient in quantity and not good enough in quality." In reply to the question, "What is the food of the agricultural labourers in your neighbourhood?" he states that "potatoes and bread form the principal food, and that butchers' meat is never touched." Again, "Do you attribute the low diet you have spoken of to the smallness of the wages, or to other causes?" "The wages are certainly insufficient. Even where there are only two children it requires good management to keep them decently out of 8s. a-week. Take any standard of comparison you please. Perhaps the fairest is the cost of the paupers' food in the union workhouses, where the articles are generally such as form the poor man's food at home—bacon, bread, and potatoes, without beer or other luxury—and where the quantity is supposed to be absolutely necessary to keep the inmates in health. If the labourer has not so much food as the pauper, he ought to have. In our union the cost of each individual, taking the average of men, women, and children, is 1s. 6d. weekly for food only; and buying by tender, we buy at least ten per cent. cheaper than the labouring man can. Without considering this, apply such scale to the poor man's family. A man, his wife, and two children will require, if properly fed, 6s. weekly; then rent, at least 1s.; and fuel will nearly swallow up the remainder. But there are yet many things to provide—soap and candles, clothes, and shoes. Shoes to a poor man are a serious expense; a good strong pair will last a year, and these will cost 12s. When I reckon up these things in detail, I am always more and more astounded how the labourers continue to live at all." Again, "Is the health of the labouring classes affected by other things besides the insufficiency of diet?" "Yes; the want of proper clothing and fuel is much felt, and is the cause of much sick-

ness. Personal cleanliness is neglected; the cottages are generally ill-ventilated and frequently damp. But all these matters, though in themselves of importance, are but secondary in comparison to the great evil—insufficiency of food."

Farmers, is this quite according to your notions of justice or of good sound policy—the *independent labourer worse fed than the pauper!* What inducement do you offer to the honest, manly labourer, struggling against poverty? Charity! tell me not of charity, I pray; but speak somewhat of justice. The charity that runs out in coal clubs, benefit societies, and that vaunts itself in long subscription lists for blanket distributions, is thoughtless and inconsistent. Give the man the just price of his work, so that he may supply himself; and teach him thus *the good lesson of relying upon his own efforts for his own support, rather than the bad one of considering society his legitimate fallback.*

Mrs. Wilshire, the wife of a farm-labourer, near Calne, Wilts, makes the following deposition before the committee:

"We never see butchers' meat; our food is principally potatoes, with bread. We eat about six gallons of bread a-week. Sometimes, when cheap, we buy half a-pound of butter a-week; but most frequently fat, which we use with potatoes to give them a flavour. Our neighbour, the Rev. Mr. Guthrie, gives us a little milk. We lay out 2½d. a-week in tea, chiefly to let my husband have a comfortable breakfast on the Sunday, the only day he breakfasts at home, and as it is the only thing I indulge in. Our common drink is burnt-crust tea. We also buy about half a-pound of sugar a-week. We never know what it is to get enough to eat; at the end of the meal the children would always eat more. Of bread there is never enough; the children are always asking for more at every meal. I then say, 'You don't want your father to go to prison, do you?' The eldest child some time ago had a swelling in his throat; I don't know what the doctors called it, but they said he must live better, and the guardians allowed 2s. a-week for meat for several weeks, and after that a smaller sum for bread, and the child got well. Two or three years ago my husband was employed by a farmer who was a liberal man, and had 10s. a-week; the extra 2s. did a great service, it paid rent and firing. We have never killed a pig for ourselves."

There is abundance of such evidence as that I have already extracted from the report, which all goes to prove the same thing; and this state of things I must in fairness say is not confined to Wilts, nor to Dorset.

My space is now filled; but I will furnish other cases as strong as those already quoted, on another occasion.

What is the cost of all this—1st, to the farmer; 2nd, to the parish; 3rd, to the county?

Sad! sad thought! The labourer is *robbed of his independence*; and when society has made him a *pauper* and a *criminal*, lo! behold! then does she stoop to put a bed beneath him, and to place food before him. Justice, my friend, is the better part of Benevolence!

[One word in justice to the Wiltshire Farmer. The action of

the present law of settlement is rather his misfortune than his fault; the same may be said of his not having mines and manufactories to carry off the surplus labour. We are afraid that both master and man are in some degree the victims of circumstance.—Ed. F.M.]

## No. II.

I can imagine that some one who has read my preceding letter is saying, "But you have said nothing about the earnings of the women and children." Of the children, it is only the elder ones that can earn their own food; and the parents have to bear the exclusive burden of their support for several years before they can maintain themselves. And the question of whether it is *right* and *politic* for children to be thrust out in the fields, destitute of education, is one that I design hereafter to consider in all its bearings. It is an injustice to the child—it is a wrong to the community.

As to the women, what right have they in the fields? Surely their legitimate place is home. One woman giving evidence before the committee, to which I have already referred, says: "I have been married twenty-five years, and have worked all that time in the fields in the spring, and at hay-time and harvest. Sometimes the children have prevented my going out. I have had 8d. a day in the spring for weeding, turnip-hoeing, &c.; 10d. a day for hay making; and 1s. a day for harvest work. I do not think a great deal is got by a mother of a family going out to work; perhaps she has to hire a girl to look after her children, and there is a great waste of victuals and spoiling of things. And then working in the fields makes people eat so much more: I know it was so with me always. I often say, there is not fourpence got in the year by my working out."

Another woman confirms this statement. She says: "I think it a much better thing for mothers to be at home with their children; they are much better taken care of, and other things go on better. I have always left my children to themselves, and, God be praised! nothing has ever happened to them; though I have thought it dangerous. I have many a time come home, and have thought it a merey to find nothing has happened to them. Bad accidents often happen. It would be much better if mothers could be at home, but they must work."

Yes, here is the secret—"they must work." It is certainly the duty of the child, under such circumstances, to earn 6d. or 4d. a day; it is likewise the duty of the wife to earn her 8d. or 10d. a day. But we come back to the old question—Is it *right*, is it *politic* that this duty should be imposed? Is it judicious of the farmer, in order to save a present comparative modicum, to saddle himself with an ultimate serious expense? These children—left to themselves, without any control over their conduct the whole day, and without instruction or example of any kind—what becomes of them? Does any one seriously expect to see such neglected creatures turn out good workmen, or creditable characters? The attention of the farmer should be directed to the children of the labourer, as well as to the labourer himself. He depends upon them for the success of his future plans of improved cultivation. Some manufacturers set a good example in this respect. They regard the children of their workpeople as though they were a

part of the raw material they have to work up; or, in better taste, suppose I say that they bestow not less care in thus securing an intelligent and informed set of workmen, than they do in improving and perfecting their machinery. One master thus estimates the value of his efforts in this direction.

Thomas Ashton, Esq., of Hyde, Cheshire, in evidence taken by Mr. Chadwick on the education of artisans, in answer to the question—"Have you, as a landlord and capitalist, thought it worth while to go to any expense in the education of the workpeople?"—says: "Yes, I have; I have provided schooling, at my own expense, for *five hundred*."

A. B., another employer of labour, who had paid similar attention to the education, the dwellings of workpeople, and their amusements, who employed about eight hundred, and at his own expense provided schooling for upwards of two hundred, stated that at first the expenditure in schooling was chiefly given from a desire to make the workpeople happy; "but," said he, "we have found that, *had it all been done simply as an investment of capital, it would have been a highly profitable one*. I would not, as a pecuniary speculation, consent to take less than £7,000 for my set of workmen, upwards of eight hundred, in exchange for the uneducated and uncultivated workmen of another manufacturer opposite. We find the steadiness of the men induces steadiness of work, and comparative certainty in the quantity and quality of the produce." Speaking of the recreation which he had provided for the workpeople, he said: "Thou mayst think it strange for one of my persuasion (he is one of the Society of Friends), but it is true, I have paid for a big drum and some horns, to give them mirth after their hours of labour." In this manufactory the cotton spinners who hire children as piecers highly preferred and competed for the children educated at the infant schools; when asked the reason, one of them replied, "Because they learn better, and require less beating."

To a certain extent, also, the husband is a sufferer through his wife's absence from home. There is not the same order in the cottage, nor the same attention paid to his comforts, as when she remains at home all day. On returning from her labour she has to look after her children, and her husband may have to wait for his supper. He comes home, perhaps tired and wet; finds his wife has just arrived before him; there is no fire, no supper, no comfort, and he goes to the beer-shop. Let those of my readers who think this no common case go amongst the labourers as much as I have done, and discover the truth for themselves. In conclusion, then, the evidence and common sense are decidedly in favour of allowing woman to keep her place, and of enabling parents to give their children some years of education. With respect to the latter point, experience leads me to advocate the adoption of a course of training partly intellectual and partly industrial. I have said, however, that I shall discuss this important question hereafter.

Very much has been well said and well written latterly concerning the benefits of travel. They can scarcely be overrated. The actual observation of men and things, affords a man more sound knowledge, than all the books in his library. Of the truths that pass before him he collects, compares, generalizes,

abstracts, and judges for himself. Whether right or wrong, the exercise of the mind upon the vital and subordinate questions of life must be highly invigorating and ennobling; and it is noticeable that a traveller ever returns from his wanderings with enlarged notions, and more liberalized views than he possessed before he packed his carpet-bag. One may pretty well go round the globe now with only a carpet-bag. Some people talk about the poetry of the "old iron hammer;" how it has beaten out the grand foundations of civilization and riveted the beams thereof, and made fast its well-wrought girders; and how its musical tinkle is the key-note of all human improvement. And this is all true enough. But who can number the variety of the pleasant associations aroused by the a visible sign of improvement when farmers are seen shouldering well-packed carpet-bags, and sallying forth between hay-time and harvest, with intent to learn what is doing in the world. I advise any farmer who may be now giving his men 7, 8, 9, or even 10 shillings a-week, to go northward, and he will be astonished with the work that is done by the labourers who are receiving 12 and 14 shillings a-week, whose boards are well supplied with bacon and moorland mutton. The amazement of the southern farmers would be great to behold what men, living in this free manner, can get through with, in the way of piece-work. They seem to be a totally different race of beings to what we find lower down. Depend upon it, that the man who half starves his labourers does a terrible injury to himself, to view the matter only in this light. With their wages, men's value will rise. Where is there such a labour-saving machine as a healthy brain? Watch the underfed labourer, with dim senses, feeble wits, dragging gait, irritable temper, short memory, and perverse will. If 2s. or 3s. a-week extra will convert such a being into a strong, healthy, robust, satisfied man—a man anxious to turn out the greatest quantity of work in the shortest time and in the best manner, one wholesome to look upon, rearing a family in a creditable manner—then, I ask, is not the change worth the outlay? Is it not worth to the farmer, to the parish, to the country?

Unmarried men are in more request in certain parts as farm labourers than married men. The weekly sum that the one has to divide amongst many, the other appropriates to supply his own personal wants. The single men, therefore, are stronger and more active, while the married men are voted drones. With better wages and more nourishment they would become miniature steam engines, working their masters' will by anticipation. I will attempt to show, in another letter, how this low-wage system affects more directly the farmer and the labourer.

Upon recapitulation, we shall see that we have arrived at this conclusion—That work may be bought just as anything else may be purchased: he who wishes to obtain good work must pay a good price; whilst he who gives a less wage must be satisfied with work less in quantity and worse in quality.

### No. III.

THE EQUITABLE WAGE PRINCIPLE *v.* THE LAW OF SUPPLY AND DEMAND.

My readers will allow me to make a slight

*detour* from the direct path by which I promised to lead them to certain conclusions, as I desire to consider more fully the bearings of the subject before us, to the end that these our conclusions may be the more just and determinate.

Much time and ingenuity have been expended by political economists in discussing the wage law, and as yet scarcely any one is determined about it, involving as it does so many impossibilities and incongruities.

Young gentlemen first awakening to the mysteries of the wage system, and finding themselves puzzled, ask petulantly, "But what regulates wages?" The invariable reply is, "Supply and demand, to be sure; what else do you think?"

Any one acquainted with the world will coincide with me, when I say, that legality and morality, justice and equity, are totally different things. A man may be morally right and legally wrong. Under this condition of affairs one becomes sceptical. I feel myself beginning to suspect a great many antiquated notions as false, although they are plausibly dressed in the garb of truth and sincerity. Amongst other things that arouse my suspicion is this law of supply and demand. Mind, I do not disbelieve its existence and operation; but, though it has acquired the title of a law, I dispute its equity, and therefore its beneficial action. I am aware that it is recognized on all hands, and that he who shall attempt to attack it may be stigmatised as a "political blasphemer." But until the injustice of the principle is exposed, there can be no hope for the labouring man.

According to Mr. Stewart Mill, production is generally a joint affair; one party contributing the materials, tools, shelter, food, and superintendence necessary for the due performance of the work, and the other contributing the work itself. In other words, production is a partnership between the man of money and the man of muscles, in which the monied man agrees to advance to the working man his share of the produce in the form of wages. Wages should then depend upon the share of the produce *justly* accruing to the working man. But here follows the inquiry, "What regulates the share of the produce *justly* accruing to the working man?" Every kind-hearted man amongst us knows full well how this is determined, for who has not seen with infinite pain the continual struggle between these two contributors as to how much the one can extort from the other, and how little the other can be starved into accepting? This is called the law of supply and demand; or, the relation between population and capital; and, as a popular writer says, "is about as just a means of deciding what is essentially a point of simple equity, as a standing army is of settling the rights of nations. Neither numbers nor power have any connexion whatever with a matter of abstract justice."

Much resort is had in the present day to pictures as a means of conveying information. Desiring, for the sake of clearness, to illustrate this law of supply and demand, I find instances, more numerous than I know what to do with, ready to my hand. I look over the Reports of Commissioners upon all kinds of employments, and I seek information from other authentic sources, and always with the same result; for I find they all directly or indirectly give evidence

of the oppressive and tyrannous nature of the law. Although a great quantity of evidence from the rural districts is before me, for the sake of change, and to show that I am by no means desirous of vaunting one class against another, but simply of helping the poor, I shall confine my quotations principally to the investigations of Mr. Mayhew. My aim is to bespeak the sympathy of masters for their labourers generally; and I hope, by leading the farmers round to a different point of view, I may be able to point out silently their own position with respect to their labourers, under the peculiar influence of a new light. In this I am aware that I yield somewhat to the very prevalent prejudice against operating upon the *beam* at home in favour of the *note* abroad; or that which is more offended by the vice of opium smoking in China, than the vice of gin drinking in England. I yield here, however, only to gain my point elsewhere; and of course my readers will allow concession for concession.

Let us begin. There are two direct means of "economising labour": 1st, by making the workmen do more work for the same pay (and this is technically called "driving"); 2nd, by making them do the same work for less pay (a process termed "grinding"). To enforce these systems there are *long-hour masters*, *strapping masters*, *sweaters*, *middle-men*, *gangers*, and *contractors*—a goodly staff, which has given rise to some "odious comparisons" between the women of America and the women of England. Concerning slop workers:

"The labour of the men," says Mr. Mayhew, "who depend entirely on the 'slaughter-houses' (commonly so called from the "cutting" trade practised in them) "for the purchase of their articles, is usually seven days a week, the year through. That is, seven days—for Sunday work is all but universal—each of 13 hours, or 91 hours in all; while the established hours in the 'honourable trade' are six days a week, each of 10 hours, or 60 hours in all."

The experience of a chair maker:

"I work from six every morning to nine at night: some work till ten. My breakfast at eight stops me for ten minutes; my dinner takes me twenty minutes, at the outside; and my tea five minutes. All the rest of the time I'm slaving at my bench. Altogether I labour 14½ hours every day, and I must work on Sundays—at least 40 Sundays in the year. This gives me more than 90 hours a week for my work, and there's hundreds labour as hard as I do just for a crust."

The east end turners commonly labour 18 hours a day.

From Mr. Mayhew's letters to the *Morning Chronicle* I give the words of a "chamber master" working for the cheap shoe trade:

"From people being obliged to work twice the hours they once did work, or that in reason they ought to work, a glut of hands is the consequence, and the masters are led to make reductions in the wages. They take advantage of our poverty and lower wages so as to undersell each other, and command business. My daughters have to work fifteen hours a day, that we may make a bare living. They seem to have no spirit nor animation in them; in fact, such very hard work takes the youth out of them. They have no time to enjoy their youth."

The following is an illustration of the "strapping system." "Never in all my life," says Mr. Mayhew, "had I seen so sad an instance of over-work. He

gave the account after a heavy day's work, and was so fatigued that he could scarcely rest in his seat."

"I work at what is called a 'strapping shop.' I call 'strapping' doing as much work as a human being or a horse possibly can in a day; and that without any hanging on the collar, but with the foreman's eyes constantly fixed upon you, from six o'clock in the morning to six at night. The shop in which I work is for all the world like a prison; the silent system is as strictly carried out there as in a model gaol. If a man was to ask any common question of his neighbour, except it was connected with his trade, he would be discharged, there and then. If a journeyman makes the least mistake, he is packed off just the same. The amount of work one's forced to get through is positively awful; if he can't do a plenty of it, he don't stop long where I am. No one would think it possible to get so much out of blood and bones. No slaves work like we do. At some of the shops the foreman keeps continually walking about with his eye on all the men at once; at others he is perched up high, so that he can have the whole of the men under his eye together. Since I knew the trade a man does four times the work that he did formerly. What's worse than all, the men are every one striving one against another. Each is trying to get through the work quicker than his neighbours. Four or five men are set to the same job, so that they may be all pitted against one another; and then away they go, every one striving his hardest, for fear that the others should get finished first. They are all tearing away, from the first thing in the morning to the last at night, and when time comes to knock off, they are ready to drop. It was hours after I got home last night before I got a wink of sleep; the soles of my feet were on fire, and my arms ached to that degree that I could scarcely lift my hand to my head. We mustn't let our employers know we don't sleep a' nights, else they'd be certain we couldn't do enough for them, and we'd get the sack. So, tired as we may be, we are obliged to look lively, somehow or other, at the shop of a morning. Some men are done up at such work—quite old men and grey, with spectacles on, by the time they are forty. I have seen fine strong men of thirty-six come in there, and be bent double in two or three years. We are used, for all the world, like cab and omnibus horses: directly they've had all the work out of us, we are turned off. As for Sunday, it's *literally* a day of rest with us—we lie in bed all day. When I'm done and flung by, of course I must starve."

Of "family work" Mr. Mayhew says: "It has the worst possible effect upon the trade. There are between 300 and 400 'chamber masters' in the 'slop' shoe trade (a chamber master is one who works at home with his wife and children, finding his own materials). The wife cuts out the work for the binders, the husband does the knife work, the children sow with uncommon rapidity. The husband, when the work is finished, at night goes out with it. He returns, sometimes having sold his work at cost price, or not cleared 1s. 6d. for the day's labour of himself and family. The shopkeepers and warehouses think the poor fellow fair prey, and buy the work at their own price. How can he refuse?—are not his children waiting for their supper at home?"

Here is the statement of a worker at "fancy cabinet" work:

"The most on us has got large families. We put the children to work as soon as we can. My little girl began about six, and eight or nine is the usual age. The small masters mostly marry when they are turned of 20. You see our trade's coming to such a pass, that unless a man

has children to help him he can't live at all. I've worked more than a month together, and the longest night's rest I've had has been an hour and a-quarter; and I've been up three nights a week besides. I've had my children lying ill, and been obliged to wait on them into the bargain. You see we couldn't live if it wasn't for the labour of our children; though it makes 'em—poor little things!—old people long afore they are grow'd up." "Why, I stood," said the wife, "with my child, only ten years of age, from four o'clock on Friday morning till ten minutes past seven in the evening, without a bit to eat or drink. I never sat down a minute from the time I began till I finished my work, and then I went out to sell what I had done. I walked all the way from here (Shoreditch) down to the Lowther Arcade to get rid of the articles." *Here she burst into a violent flood of tears, saying, "Oh! Sir, it is hard to be obliged to labour from morning till night as we do, all of us, little ones and all, and yet not be able to live by it either."*

If these touching pictures teach us nothing of the evil effects of the law of supply and demand, it were in vain to proceed. In order to complete the subject, however, I must recur to certain other evidence relative to the contract system, which is one of the

main features of the law under discussion; and this will be better left till another week.

The cases in which the earnings of the parents are insufficient, under good management, to support their families in comfort, are painfully frequent. Besides the rural districts (for we must not forget the main object of this inquiry), they abound in the coal districts of England and Wales, in calico printing, and in many branches of metallic manufactures, &c. Nothing save the actual pressure of want would drive the operative to extract subsistence from the hard-earned wages of his children.

Here we behold the law of supply and demand in operation; and not alone here, but in the working of the "sweating system," which, by introducing the work of women and children in the place of men's, sets wives competing in the struggle for daily bread against husbands, and children of the same family against themselves. We witness, in fact, one continued and deadly struggle between the two contributors to production, *as to how much the one can extort from the other, and how little the other can be starved into accepting.* F. R. S.

## THE SEASON IS UNPROFITIOUS: WHAT SHOULD FARMERS DO?

It has been my pleasure for some time, as a contributor to the *Mark Lane Express*, to render the best aid I am able towards promoting the progress of British agriculture, being anxious to prevent improper management on the one hand, and to advance improvement on the other.

It is with much diffidence I usually address my readers, and have hitherto adopted writing in the plural number lest the personal pronoun *I* should appear too egotistic, and savour of aggrandisement: whereas my humble wish is to give such practical aid as my experience has taught me to be desirable, and in a manner least open to censure or animadversion. I purpose in future, however, to drop the plural number, and write simply as "*a practical farmer.*" My wish, in this paper, is to call attention to the course of management which a farmer should adopt in this most unpropitious season.

In many parts of the country scarcely any wheat has been put in: nearly all the heavy clay lands have yet to be sown. The unexampled rains which occurred in November so saturated these clays, that it became requisite to replough them, and lay them up for frost. None, however, came; but, more rain falling, caused them to set or run together as before. Most farmers were led to hope for dry frosts in the latter part of December. In this they were disappointed; and, although the weather was sufficiently fine to permit many holders of mild loams to finish their autumn sowing, yet there was no hope for the clay-land farmers, and but a partial respite for others; consequently, much remains to be done.

The question, therefore, is, What should farmers now do? The late very unseasonable weather has prevented winter sowing. All wheat crops now sown are liable to many vicissitudes, and the product is most uncertain; blight and mildew are almost sure to attack them. The quick and over-abundant

growth of straw prevents the healthy formation and maturing of the grain. I have seldom known it answer to sow wheat in March; even the spring varieties on good soils often prove of little value: they become heavy, and get laid.

As a practical farmer, I will say once for all, that it is very hazardous to sow wheat at this season of the year:—however, it may be quite requisite on some holdings: and of these I would observe, be cautious and patient—cautious in the choice of the variety of wheat, and patient in putting it in. Do not sow until the land is in a good state of preparation. One of the best crops of wheat I ever heard of in the course of my experience, was a crop of the *old-bearded spring wheat*. It was sown on the 21st of May, yielded five qrs. per acre, and was sold in 1814 (I think) at £8 per qr. I shall not certainly guarantee the price, but I think it probable that something like the produce may be very generally obtained.

*The old-bearded spring wheat:* This I recommend as the best for late spring sowing. I have sown it as a change in the rotation, instead of oats; and it is a good crop on which to sow seeds—I think preferable to either oats or barley. The next varieties I should recommend are the white and red Talavera wheats. The white is most valuable. I have grown it with profit on late spring sowing. I believe most of the Mediterranean or the Cape wheats would do well. Any variety possessing early maturity will do best: and many such are professedly sold. It is to this point I urge caution. We have in various districts the April wheat, the thirteen weeks' wheat; and other similar varieties. In every district farmers profess to have "sorts of wheat," producing good crops in a short time. I hope they may be found correct.

Should it, however, suit the occupier to relinquish



wheat sowing for once, I believe he will find he can appropriate his land to a better profit. The cultivation of beans, peas, barley, oats, or rye will pay him better. Potatoes, again, may advantageously be introduced. Flax, also, in many instances, might take the place of beans, peas, or oats; and, as flax-mills are in course of erection here and there, and railways form means of ready transit, it may prove a profitable crop. Manufacturers will generally give from £9 to £11 per acre for it upon delivery, or they will give from £3 to £1 per ton for the straw. The seed will readily make 7s. per bushel. A good crop will produce from 20 to 24 bushels of seed, and 2½ tons of straw. The expense of cultivation to delivering the whole produce is about £3 per acre. It should be sown between the middle of April and middle of May, at 2½ bush. to the acre. It may be asked, will the landlord permit this? I do not stop to inquire; he must be a queer one to refuse under such circumstances.

It may not be amiss to suggest that these crops are not always the most profitable. A good and early crop of rape or turnips is occasionally very

valuable. I had a small piece two years ago: it was ready to stock in the early part of July. The number of sheep fed thereon was astonishing. Many farmers in the Cambridge and Huntingdonshire fens sow rape for early feeding, and with great success. It may also be desirable to put more of these lands under fallow:—thus good and early crops of mangold-wurzel, cabbages, or Swedish turnips may be obtained.

The fattening of stock is fast becoming more profitable than the growth of corn; and, if the accidental missing of a corn crop should lead to a really favourable change from corn cultivation to stock feeding, the present unpropitious season may prove beneficial. The potato disease is likely to secure a lasting advantage to the Irish population, now the worst has passed. I hope better things for the English. I believe the present high price of stock will induce large importations both for grazing and slaughtering, as also the extension of breeding in this country. I therefore suggest the cultivation of more green crops for the ensuing winter, instead of an uncertain crop of corn.

#### IMPORTANT COMPENSATION CASE.—DAMAGES £18,000.

The true position of the agriculturist is one that has even yet to be properly established. Compared with other classes and professions he has anything but that recognised standing so generally allowed to them. The tradesman settles himself in his shop, with the full conviction that the slightest impediment to the fair conduct of his business will be amply compensated. The professional man forms his connection under quite as strong a security. We have been long taught to feel that the rights of these citizens must not be invaded with impunity. The means they may have employed to extend and develop to the greatest degree the labour of their vocation must, and will, always be regarded as clearly a part of their own property. Were it not so—were there not some such sense and practice of justice to fall back upon—industry and ability would lack their grandest inducements. No man could make the most of his power and opportunity if he felt anything like a doubt as to who might reap where he alone had sown. Few men have greater need for full satisfaction on this point than the working farmers of the country, and few in reality enjoy it in so small a degree. It is not our purpose here to place, or attempt to place, the tiller of the soil in antagonism to those with whom he has chiefly and most directly to deal. Rather let us see how he is treated by the rest of the world. Simply, then, as the creature of circumstance. He may rest for a while, perhaps, and arrange his wares to the best advantage for a market; but he must “move on” again at the shortest of notice. And there is little cause, either to delay such a notice, should it be to the convenience or profit of any one to issue it. His actual losses or contemplated profits are commonly reckoned by the very mildest of metres. It may and does no doubt sound serious enough to knock

a tradesman's shop over his ears, but a mere farmer may be routed wholly or partially at very little cost to any one but himself. “He has only to go and do a great deal better somewhere else than even he did here.”

We do not say with whom lies the chief fault; but so it is. Any interruption or interference with the business of farming is rarely met in the same spirit of liberality, or of even due sense of right, that is accorded to other pursuits. We have a striking instance of this in the following case which we have thought it only proper to report at length. It is what is commonly called a “compensation case” to estimate the real value of what is as well known as “accommodation land.” The parties to the suit it will be seen are Mr. Eve as plaintiff, and the Victoria Dock Company as defendant. The former it seems made what was considered a very exorbitant demand for some marsh land the company had the power to take from him for their own use. They were advised to resist, and they did so. Had Mr. Eve been a market-gardener, or a pleasure-ground publichouse-keeper, or a ship-builder or a timber-merchant, or of any such a calling that might require room and space for the carrying out of his business, we have little doubt but the company would have much sooner reconciled themselves to the assumed “exorbitancy” of his claim. Unfortunately, however, it was professed on no better grounds than the injury he would suffer as a farmer and grazier. In this humble character the land now taken *volens volens* from him was of especial service. It was indeed to him, in the fullest sense of the term, “accommodation land.” By the use of it he could always command the best market, and make the most of those animals in the selection and management of which he was

generally admitted to have achieved some well-merited distinction. In the words of one witness, "as a grazier he stands first."

With then some character and some business, if only as a farmer and grazier, Mr. Eve makes a claim, to which the Company considerably respond with an offer of one-half! They know the class they have to deal with, and how much attention is likely to be paid to any such kind of compensation as that they have in this instance to make. Well advised and well satisfied as to the strength of their position, the Company adhere firmly to their own terms. Strange to say, the farmer and grazier stands as manfully to his; and so "this present claim," to adopt the very qualified language of the Solicitor-General, "the most outrageous, grossest, and extravagant, was submitted to a jury." The result must be the best commentary. Mr. Eve put his compensation at twenty thousand pounds—the Company, "well advised" as they were, put it at ten; and a special jury, after viewing the land, settled it at eighteen thousand pounds. Mr. Eve thus obtaining within a tittle of what he first asked, and on which he was complimented, as being outrageous, exorbitant, and gross in the highest degree.

We congratulate Mr. Eve on the spirit he has displayed and the victory he has achieved. Had he been in any way a weaker man, we should most probably have still wanted the moral of that lesson his determination has afforded us. It comes all the more grateful for the need there was for it. Had this been the case of almost any other business man, we are very much inclined to believe it would never have been suffered to go before a jury. As it is, we gain one step more towards the proper position and condition of the English farmer—one in which his rights will be respected, and his own maintained as clearly and indubitably as those of his neighbour. We have not, we repeat, quite arrived at this as yet; but it must be our own fault if we do not speedily reach the summit.

The name of Mr. Eve must be already familiar to many of our readers. This is not the first good cause he has fought in, although his efforts have not so far been always attended with the same success. For it was, who, acting on the experience of many years, and totally regardless of anything but that his sense of right and humanity dictated, so boldly denounced and so forcibly portrayed the abominations of Smithfield market—that very market, which, as will be found, he could reach under such peculiar advantages; but which he has, nevertheless, opposed, with a regard only for the public good, that must eventually end in another triumph.

(BEFORE DEPUTY SHERIFF T. M. GEPP, ESQ., AND A SPECIAL JURY.)

#### EVE AND THE VICTORIA DOCK COMPANY.

This was a writ of inquiry to assess the damages which W. William Eve, North Oxenden, farmer and grazier, was entitled to receive from the Victoria Dock Company, for certain land, &c., required by the latter.

Sir Frederick Thesiger and Mr. Tindal Atkinson, instructed by Mr. B. W. Rawlings, of Romford and

For invalidation, appeared for the claimant, and the Attorney-General and Mr. Bovill, instructed by Messrs. Burchell and Parsons, of Parliament-street, represented the Company.

The jury having viewed the property which was the subject of the inquiry, and returned to the Swan Hotel, at Stratford.

Sir FREDERICK THESIGER objected to Mr. Saunders, of Woodford, being sworn upon the jury, on the ground that he had made some observations upon the case, which he (Sir Frederick) would rather not repeat.

The ATTORNEY-GENERAL apprehended that it was nothing but perfectly fair and natural that while the gentlemen were discharging the duty of viewing the property, they should confer together.

Mr. SAUNDERS wished to know what he had said. He believed he (Sir Frederick) was very unjust.

Sir FREDERICK.—Pray, sir, don't say that I am unjust, for I know of nothing beyond what has been communicated to me.

The DEPUTY-SHERIFF here intimated that Mr. Saunders had better retire; and the following gentlemen of the county were then sworn as the jury, viz.: George De Horne Vaizey, of Halstead, Esq. (Foreman); David Thomas Magan, of Leytonstone, merchant; John Goslin, of Bradford-street, Bosking, merchant; William Hugh Rankin, Bran-hills, Great Stambridge, merchant; Robert Ellington Greenwood, Halstead, banker; John Sampson Piggott, Langford, merchant; John Knowles Salford-hill, Woodford, merchant; James Bateson Richards, Woodford, merchant; George Horatio Wilkinson, Stratford, merchant; Andrew Caldico, Junior, Woodford, merchant; Frederick Pupard, Upton-place, West Ham, merchant; and William Palmer, of Woodford, merchant.

Sir FREDERICK THESIGER observed that this was a case of very considerable importance to Mr. Eve, the claimant, and he was only apprehensive, in the discharge of his duty to him, that he would not be able to present it to the jury in a proper light, and that his interests might be thereby prejudiced. He hoped they would consider that what he was about to say was merely introductory, in order to prepare their minds and enable them to come to a proper conclusion upon the evidence which would be brought before them. He was happy to say that their duties would be very much lessened by the advantage they had had of having a private view beforehand, and he should not attempt to prejudice their minds by any remarks of his own. They were all aware that Mr. Eve had been compelled to come before them and seek compensation from this company. It would no doubt be said, that when this dock was constructed it would be of very considerable advantage to the public; and undoubtedly it might be assumed that the Legislature would never have sanctioned this Act of Parliament, unless the public were to derive great benefits and advantages. But, on the other hand, he need hardly say that, if the public advantage had been alone consulted, the company would not have appeared before the jury that day. The Dock Company was a private company of gentlemen, seeking their own individual interests, and they had obtained an Act conferring upon them some enormous powers. If Mr. Eve had been allowed to remain in the undisturbed possession of his land, he would have obtained in the course of a few years a much larger amount for it than he could hope to receive under the present circumstances. The company obtained their Act in 1848, but nothing was settled until 1850, and Mr. Eve was then required to send in his claim, and he did so, at £20,000. The company, however, did nothing on that occasion, and he (Sir Frederick) need hardly say that, as a farmer, Mr. Eve was considerably crippled in his operations. After the lapse of some time he urged the company to come to some settlement, and after considerable delay, he received a letter offering him £10,500. The jury would observe that there was a great discrepancy in the two amounts, and he should call before them a number of witnesses showing that Mr. Eve's estimate was a correct one, and he anticipated that the company, in seeking to reduce this claim, would call

before them some of the many gentlemen of ability and experience which they always had at their command. If they failed to do that, he was sure the observations of counsel, however ingenious and eloquent, would have but little weight against the evidence of the claimant's witnesses. He should state that Mr. Eve was a farmer, at North Ockenden, in this county, where he occupied land to the extent of 1,000 acres; he was also in possession of some marsh-land at West Ham, to the extent of some 62 acres, in two plots, of about 40 and 20 odd. The marsh-lands were in the very highest state of cultivation, and, as grazing-lands, were of the very best quality. The mode in which he carried on his operations were these: he was in the habit of purchasing lean cattle in the autumn, and taking them to his farm at Ockenden, and in the following spring they were brought to West Ham, where he was enabled to fatten them much sooner than any other farmer in the neighbourhood, and send them to Smithfield, where they fetched high prices. If Mr. Eve had not those grazing-lands, but only his farm, he would have been compelled to send them to market a distance of 24 or 25 miles; and if the prices were low, he would have been obliged to have disposed of the beasts at a sacrifice, or must have driven them back to his farm. Instead of this, the marsh-lands enabled him, from the proximity of Smithfield, to send up an agent to market and report to him the rise or fall in prices, and, if the markets were good, he had only to send his cattle a distance of four or five miles, and thereby derive great advantages. Now, unless equally good land in the neighbourhood could be found for Mr. Eve, the whole of his farming-business would be seriously interrupted and completely disorganized. Mr. Eve was not only the owner, but also the occupier, of these lands, and therefore he was entitled to receive compensation in both characters; just in the same way as, if he let the land to a grazier, he would be entitled to compensation for the rent which the grazier would pay him. Evidence would be clearly and distinctly given that, as occupier, he had been deriving a benefit of £5 per acre from this marsh-land; and if Mr. Eve was to be merely compensated by giving him the bare value of grazing land a very great injury would be inflicted upon him, because the price of land in this immediate neighbourhood had latterly increased to a very extraordinary value. One of the causes was the construction of the North Woolwich Railway, and the gentlemen connected with that railway were also concerned in the Dock Company, and being sharp-sighted and far-seeing gentlemen, they purchased a quantity of land which runs by the side of the railway for about three miles, and which he was told the jury were not permitted to go upon.

**THE ATTORNEY GENERAL.**—They must pay toll. It is a private road, and the companies are quite distinct from the Dock Company.

**SIR FREDERICK THESIGER resumed.**—He was told that for a considerable period no toll had been taken, and that it had only been opportunely revived for the obvious purpose of deteriorating the value of the claimant's land in the eyes of the jury, but he thought they might have spared the toll at all events. The railway gentlemen having completed their line, sold the land which they had purchased at £1 and £2 per acre to the Eastern Counties Railway Company in some instances for £500 per acre, in another for £700, and in one case he believed they obtained the enormous sum of above £1000 per acre. These far-seeing gentlemen finding that the investment of capital in land was highly productive, formed themselves into a Woolwich Land Improvement Company, and set about erecting the Pavilion Hotel and pleasure grounds and other buildings thereon; and it certainly seemed very singular that they should not have constructed the Docks out of the land so purchased, but they thought that, instead of appropriating their own lands to that purpose, they would get hold of other people's land at their own low prices, and sell it again at improved amounts, which it would be sure to fetch in consequence of the impetus given to trade and commerce by the docks and railway. The Dock Company derived under their Act of Parliament certainly the most extraordinary powers. They were empowered to take land in the neighbourhood, to the extent of two hundred acres, for the purpose of grazing lean cattle thereon, which they might import into this country to the detriment of all the graziers in the neighbourhood. There was nothing to prevent their applying those 200 acres to building purposes, and therefore it was perfectly clear that they possess not only the compulsory powers to take Mr. Eve's or any other person's land,

but that they could also apply it to any purpose they thought fit. He should be able to show them that Mr. Eve had been offered £350 per acre, and that would amount to more than he claimed. He should show that that was an inadequate sum, and that persons in the neighbourhood had refused it. That the Company had asked £600 per acre, and he should be able to establish that fact. Since the formation of the railway a complete town had sprung up in the neighbourhood; that a factory had been erected by Mr. Wear, in which 1,000 or 2,000 hands were employed; that houses were built, and that the moment they were built they were occupied, and that there was an increasing and constant demand for houses. He thought he might say that it would be both unjust and unfair to take this land from Mr. Eve, and compensate him for it as merely agricultural land, and which might reduce the value he was entitled to receive by one-half of that amount which, under all the existing circumstances, he ought to be paid. He should mention to the jury that since Mr. Eve's claim had been sent in, it had been discovered that under the surface of the land there was a layer of very valuable brick earth, and an agent of the Company required that trial holes should be made. Now, what had the Company to do with anything beneath the surface if they were going to buy the land for grazing purposes only? But it struck the Company that it was most important to ascertain whether or not the land contained brick earth for the purpose of constructing their docks. Well, upon the experiment being tried, they found that there was a layer of brick earth four or five feet deep, and beneath that some peat which would be valuable to them for the purpose of burning their bricks. He found by advertisement that the Company would require to be furnished to their contractors 20 millions of bricks for the purpose of constructing their docks. The jury would observe that this was an actual property, the same as a coal or copper mine, as the brick earth was found upon the premises. The Company, therefore, had no right to say that they would only pay Mr. Eve for the surface of the land. The jury would also observe that taking away the brick earth would not destroy the value of the land, for it would be just as valuable for building purposes after they had received 2s. 6d. a thousand or so for royalty on taking away the brick earth. They were bound to compensate Mr. Eve for the value of his land according to all the purposes for which it would be applicable under the existing circumstances of the case. He had presented to them this case in these different forms, and he now asked the jury with great confidence if Mr. Eve was not entitled to compensation in the different ways in which he (Sir Frederick) had submitted his claim to them. He should call witnesses who would state that as agricultural land it was worth as surface rent £5 per acre, and the jury would not think that exorbitant when he told them that Mr. Beswick paid him £12 per acre for five acres, and had also laid out a considerable sum in improvements on it. In dealing with Mr. Eve's right as the owner of this property, they would find it had been calculated at £10,134; and as it had now become quite as usual as compensation cases themselves, the jury would have to add 25 per cent. for compulsory sale, which would make the claim amount to £12,667 10s. 6d. The jury would also have to compensate him for his life interest and net annual profit on the land, which, with other items, made the claim £17,300 9s. 10d. There was also another point for their consideration, and that was the improving value of the land. One gentleman would be called before them who would prove it was £100 per acre, which would make £6,000 odd; and it would be for the jury to judge if the land remained in Mr. Eve's possession, and considering the increasing value of it for building purposes, whether this was not fair and reasonable. There was another item for the consideration of the jury, and to which there was some objection, and that was, the damage which would be done to the farmers at North Ockenden. By the taking away of these waste lands by the company Mr. Eve would sustain a loss and injury in his pursuits at Ockenden as a necessary consequence. Let the jury suppose that this company had taken in the neighbourhood of London a steelyard which they meant to employ in carrying on these docks. Now, if they were deprived of that steelyard, would they not be entitled to receive compensation, when they could prove it was necessary for the purpose of carrying on these operations? He would say, therefore, that the Company were bound to compensate the claimant for any damage done to his farm at North Ockenden; because his farming operations would be completely interrupted and disorganized. He takes

that loss at 5s. per acre, at 12½ years' purchase, which amounted to £2,500. Then another item, for which he claimed compensation was, that he would be for some time a loser by the non-employment of his capital, and that was taken at £500. He would refer the jury to a case which was tried at Hull, and in which the jury gave £300 for the probable damage which the party would sustain by not being able to continue his business. That case was taken before the Court at Westminster, but the verdict of the jury was sustained. The total amount of the claim which the witnesses would establish before them was £26,110 16s. 10d., and which Mr. Eve now asked at their hands. He would now proceed to call before them several gentlemen of high character, and who were competent to form a correct judgment on the estimates laid before them. He did not know what course the Company intended to pursue on this occasion; but he knew that the usual course which was practised was to rely upon a powerful and ingenious speech of counsel; but the jury would hardly be satisfied with that, unless they had an opportunity of judging by evidence, and by evidence alone, whether the opinions and calculations which the claimant's witnesses had formed were correct ones.

The ATTORNEY GENERAL was understood to intimate that he should call witnesses.

Sir FREDERICK THESIGER said he was obliged to his learned friend. He was quite sure, in a case of such importance, the Company would not be content to make a blind offer, without consulting and relying upon the judgment and responsibilities of the respectable surveyors by whom they were surrounded.

Mr. RICHARD JOSEPH IRELAND examined: I am a market-gardener, grazier, and farmer, and also a valuer of land, in the neighbourhood of Plaistow. I have been engaged in farming all my life. I have had my attention directed to Mr. Eve's land. It is equal to any land in the level, and superior to a great portion. I consider the land worth £5 per acre at the present time. An acre would fatten two small beasts and five sheep. The beasts could be purchased at £12 the two, and the five sheep for 27s. After being fattened on that land, the beasts would make 10 gs. each, and the sheep 35s. each. I should put down the profit for grazing purposes at £5 per acre. It is a very great advantage to Mr. Eve to be able to send his cattle to Smithfield several times in one day. I know he has done so. The value of the land in the neighbourhood has greatly increased, in consequence of the railway, and the land taken for building purposes and for the Dock Company. Several applications have been made to me for land during the last two years.

Cross-examined by the Attorney-General: I have been a valuer only a short time—a few months. I farm twelve acres of marsh-land myself, about a quarter of a mile from Mr. Eve's. I have got, altogether, about 60 acres in the Marsh. Some of it lies a very little distance from the Docks, and some near the Barking-road. About 20 acres are my own. I let to others between 30 and 40 acres, which I farm from other people. It is not all good land in the Marsh. Some is very inferior to mine. I farm 108 acres of the Company, and pay them £400 a-year, which includes the buildings upon it. I let a little under four acres at £3 per acre. I don't know that that is compensation land (a laugh). I mean to pledge my credit that Mr. Eve's land is equal to any in the Marsh. I do not know the Winchester College Land in the marsh. I am not aware that the Woolwich Land Company have now as much as 200 acres to let in the Marsh. More than twelve months ago land was sold in the Marsh at £115 per acre. A great many buildings have been erected lately—Mr. Ware's for instance, that is in the Marsh's. The old road which ran into the Marsh was the Old Manor-road, and was sometimes in a very bad state. I have known for the last two years a gate being up and toll taken for a short period. I believe it is open now.

Mr. CHARLES STURGEON examined.—I am a farmer, and know Mr. Eve's land. It is of very good quality, and he is in the habit, I believe, of manuring it highly. Mr. Eve sends cattle from the farm at North Ockenden to graze in the Marshes, and when fattened they are sent to Smithfield. It is a great advantage in my opinion to have land so near the market to which cattle are sent. Mr. Eve's land is better than the generality of the others in the Marshes. I paid £5 5s. per acre for 15 acres in the Marshes in 1846-7.

Cross-examined.—I carry on business at Grays and South

Ockenden. My farm at Ockenden is 668 acres, and at Grays about 550. The latter is chiefly upland, and the former low meadow land. My land did not pay rates and taxes in the Marshes. I do not know that the outgoings amount to 26s. per acre. They were included in the £5 5s. I gave up the land in the Marshes because I took land at Grays, and found that it wanted a good deal of money to stock, and that I could keep mine at home. There is a great deal of land farmed at Ockenden without persons having land at the Marshes. I think Mr. Eve does more than any other person to his land; he uses guano, bone-dust, and other high manures, which must cost him £1 per acre.

Re-examined.—There are marsh lands all the way to Plaistow; but the further you go away from this neighbourhood the less valuable they become.

RICHARD GOSLING examined.—I am Mr. Eve's Marsh looker, and have been so for 19 years. This witness merely confirmed the preceding ones.

Mr. RICHARD STEVENS, of Nazeing Farm, and cattle-dealer, examined.—It is a great advantage to Mr. Eve to be able to ascertain the market prices before sending his cattle for sale. I have known his cattle to be driven to market in the middle of the day. If he had resided a distance from the market, he must have taken the chances of the market, or driven the cattle back again. I consider it is a very great advantage to a farmer at Ockenden to have these lands. I know of no other land equally good and so near to the markets as these.

Cross-examined.—I don't know that a great many changes have taken place among the marsh graziers within the last few years. Some changes have taken place from the importation of cattle. The value of the marsh and its proximity to the metropolis is always calculated and taken in as an element in settling the account of rent. I don't know that graziers have made any particular losses in these marshes. A great deal depends upon management and the seasons.

By Sir F. THESIGER.—I have known Eve to have made a great deal by taking down to the marshes lean beasts. As a grazier he stands first. In my opinion he is second to none.

Mr. ALLEN proved taking some earth out of the land belonging to Mr. Eve—he supposed it to be brick earth. It was similar to clay, and he gave it to his man Harding.

ARTHUR HARDING proved that he took the clay to Mr. Coulson at Highgate.—The latter, on being sworn, said, The earth I received from Harding, I made into the brick produced. I burnt it in a kiln instead of a clamp. If I had had greater conveniences, I could have made a superior brick to this, because I could not regulate or temper it well.

The Foreman of the Jury.—His brick is very light. Witness.—That is because I could not mix other things with it.

What do you mean by that—other soil from other land? Witness.—By mixing Thames sand with it, which can be got close by.

Examination in chief resumed.—I have taken the royalty at 2s. 6d. per 1,000 bricks, and on an average of ten millions per year, it would take twenty-nine years to exhaust the brick earth, which is six feet deep from the surface. I have calculated that after allowing two acres for ditches, &c., the land would yield 4,840,000 bricks per acre, and that the royalty would be £3,569.

Cross-examined.—I know that they make bricks at Cowley; I have been there to value them. The royalty there is only 1s. 6d. per thousand; but that is different, as the carriage is more difficult. I know there is a canal there—that there is a ferry, although I cannot get to it but through the Woolwich Land Company's private road. If I could not get through that road, I suppose I could down the Manor-road—that is not very bad. The cost of bringing up bricks from Cowley to London is 6s. to the river Thames, and 4s. 6d. to Camden Town. We could take the bricks from this part to the creeks on the river Lea. The river Lea is not three miles off, nor two-and-a-half, in my opinion. I should have to pay for Thames sand to mix with the bricks; I have paid 7s. for it, but could get it here at 2s. I thought the Woolwich Land Company's road would have been one way of getting bricks, but you cannot shut us out altogether (a laugh).

The ATTORNEY-GENERAL.—But you know you must not use this road without paying us for it. It cost us altogether £30,000.

Witness.—I should have been very glad to have made it for £15,000 (a laugh).

**THE ATTORNEY-GENERAL.**—What quantity of sand would you have put in this brick?

**Witness.**—I don't ought to tell you my judgment (laughter).

[The learned counsel here desired the witness to break the brick, which he did, and the operation created considerable mirth from the fear which was evinced by the members of the bar at the flying fragments.]

**THE ATTORNEY-GENERAL.**—And you say this brick is as sound inside as out. Why it puts me in mind of the cigars, which are sometimes bought and filled with a very different material from the outside (laughter).

**Cross-examination continued.**—We want a dry and high atmosphere for drying bricks. A marsh is advantageous, because it is dry in summer; and we want good level ground.

**THE ATTORNEY-GENERAL.**—And there is no other level, I suppose, but this marsh?

**Cross-examination continued.**—I should burn the bricks with ashes and breeze. That must come from London, and would incur a small cost, according to what you say. I am quite confident that if I put ashes over the peat it would sustain the weight of the bricks. I should use part of the peat only for burning the bricks with. The marsh having water is not a disadvantage in making bricks. I could go down six feet of the brick-earth without being swamped by the ditches and drains. When the trial-holes were dug they filled with water, but that is always the case almost.

**Re-examined by Sir Frederick Thesiger.**—I have had 35 years' experience as a brickmaker. I was applied to by Mr. Deane. If the bricks are burnt in clamps they will be a better colour than the one produced. By putting Thames sand with them it makes them heavier. I have no doubt whatever that Mr. Eve's land is good for the purpose of making bricks.

**By the Jury.**—The weight of a brick would depend upon the quality of the earth of which it is made.

**MR. JOHN TULLOCH FISHER** examined.—I am an auctioneer and surveyor at Plaistow, and have been so for three years. I have been a builder and surveyor for 14 years before that. I used to employ, on an average, about 120 hands as a builder. I have also been largely engaged in surveying and valuing of land. I know the marsh lands. On the 4th of May and 29th of July last I sold some marsh land; on the 4th of May four acres near the North Woolwich road. They averaged about £800 per acre, after deducting the quantity of land in the road and the making the roads. The other portion realized £990 per acre for two acres adjoining the four acres, and the other lot, comprising an acre and an eighth, realized £1,220. I was authorized to expend £10,000 in the purchase of land and houses, for the purpose of re-selling them. I applied to the North Woolwich Land Company, and stated that I wished land with a river frontage, for which I was to pay £750 an acre, and for any in the North Woolwich road at £600 per acre, with the proviso that I should take the whole, and that there should be no severance. The company had land all down this road. I am now superintending seventeen houses down the Woolwich road, and the moment they were finished I had persons after them, who paid deposits immediately. They were all let as soon as up, many of them before they were finished. I made an offer to Eve, on behalf of Messrs. Westwood and Bailey, to pay him £350 per acre for twenty acres of his land, but it was refused. It was a voluntary offer on my part, and was made in September last. I think his land is quite as advantageously situated as the company's at £600 per acre.

**JUROR:** In making that offer, did you take into consideration that you should have access over the Company's road?

**Witness:** I intended to purchase two plots of the Company's land, and thereby amalgamate those purchases with Eve's, which would have given me a right of way over the whole.

**THE ATTORNEY-GENERAL:** But the company you are speaking of is a distinct company from the Dock Company, with different directors and shareholders.

**Sir F. THESIGER:** But supposing this company to buy Mr. Eve's land, would it be worth £350 per acre to them?

**Witness:** Yes; and I have no doubt they would ask £600 for it when they got it.

The witness then went into a minute calculation of the value of the brick earth, and arrived at the result that the claimant was entitled to £17,390 3s. 2d. present money for his interest therein, £3,084 10s. 7d. for grazing and surface rental, £80 per acre for the fee simple after the excavations,

and 25 per cent. for compulsory sale, which gave a grand total, after deducting outgoings, of £28,632 18s. 7d.

**Sir F. THESIGER.**—Why do you add 25 per cent. for compulsory sale?

**Witness.**—I have done so because I find that a Committee of the House of Lords—

**THE ATTORNEY-GENERAL.**—Oh, stop! stop!

**Witness.**—Well, I thought that a Committee of the House of Lords was a pretty good authority.

**By Sir F. THESIGER.**—It is usual to add 25 per cent. for compulsory sale. I have no doubt very good bricks could be made from this land. I know Howard's wharf very well. There is access to the River Thames from his wharf. I was employed last year to take brick earth from the marshes. I did not at that time know Mr. Eve's contained brick earth. I was then employed by Mr. Perrin. I offered £5 surface rental and 2s. 6d. royalty. The land I offered that for belonged to Peters and Freuch, and was not so good as Eve's, because there was a long cartage over the iron bridge, and it was a greater distance from the water. There has been a great demand for bricks in this neighbourhood for some time. I have no doubt that Eve could get what I have stated from a brick-maker.

**Sir F. THESIGER** here addressed some gentlemen opposite, and said he hoped they would not sit there grinning and making grimaces, but behave with decorum as became witnesses.

**THE ATTORNEY-GENERAL.**—They are not witnesses yet, and when they are I hope and believe they will conduct themselves with propriety.

**Sir F. THESIGER.**—I hope they will conduct themselves with decorum without being called as witnesses.

**THE ATTORNEY-GENERAL.**—They have their backs to the jury, and cannot be seen.

**Sir F. THESIGER.**—I hope they will not set their backs up (a laugh).

**THE ATTORNEY-GENERAL.**—If anything would make them set their backs up, it is such atrocious wit as that (laughter).

**Cross-examined.**—The four acres I sold is close to Mr. Mace's factory. I believe he employs over 2,000 men, and buildings were required for those men and others in the neighbourhood. The character of those buildings are six room cottages, let for £20 per year.

**THE ATTORNEY-GENERAL.**—Is there anything but open land between the public-house and Mace's factory and the 40 and 20 acres belonging to Eve, of which you have been speaking?

**Witness.**—Nothing.

And that I believe is three-quarters of a mile and half a mile distant from these two plots of 40 and 20 acres? Yes, and unless I could get access to the new road from Stratford to North Woolwich by the south east side of the railroad, I would not have given what I have stated for it. The Dock Company have taken a quantity of land, which has of course increased the value of grazing land, and I am now instructed by a gentleman at Plaistow to give the same price for land which the railway paid him, viz., £165 an acre. His name is French, and he is a cattle-salesman and grazier. I am not confined as to purchasing any reasonable quantity of land. I have frequently known 2s. 6d. and 3s. given for royalty on bricks. That was not for royalty on bricks to be made in the immediate neighbourhood, and used there, but for bricks for sales. I think the brick earth on Mr. Eve's land would require chalk and sand and clay to be mixed with it to make good bricks. If access could not be obtained to the river by the new road, the chalk must be got from the river Lea, and that of course would add to the cost of making the bricks. In my judgment this is a good clay for the purpose of making good bricks.

**THE ATTORNEY-GENERAL.**—Do I understand you that you would give him all the opportunities of making bricks, and then 25 per cent. for compulsory sale?

**Witness.**—I do not give him all the advantages I might, as I have not made an estimate of his cost for making up his land for grazing purposes. I have heard Mr. Heath paid £100 an acre for his land in the marshes.

**Re-examined.**—Mr. Whittaker paid £100 (more or less) some years ago. Since then, the value of land has greatly increased. No doubt it will be required for building manufactories and houses. No ground can be obtained further up the river equal to this.

Mr. SIMON HOWARD, glass manufacturer, in the bank of the Thames, examined.—I employ a number of workmen. I paid £450 an acre for my land, and have a right of way over the road by the side of the railway. I am willing to give Mr. Eve permission to come to my wharf; he has applied to me, and I told him so.

Cross-examined.—I am not aware that my right of road is on the south-side of the railway, and that I am only allowed to go over the north-side until the other is completed. I obtained my right from the North Woolwich Land Company. The land I bought has a right of frontage to the river. I have no land in the marshes.

Re-examined.—We have made a road from the railway which leads us right up to our works. I never paid toll on the road which runs by the railway.

Mr. GEORGE PRICKETT examined.—I am a land surveyor and valuer at Highgate. I have been in business for forty years, and have known the marsh lands for many years. I was in treaty for the sale of some trust lands, which were in Chancery, and sold them to the Company. They were freehold and copyhold, and I got £210 per acre for them all round. They were fettered with trusts; and Mr. Eve's lands are more valuable, because he can sell it when and to whom he pleases. I consider the fair price for Mr. Eve's freehold land would be £300 per acre—that would give £16,050; and the copyhold of 3½ acres would come to about £1,800, making £17,850 for the surface. That is for the owner's interest only, and is without reference to the occupiers or the brick earth.

Cross-examined.—I put the land at £300 per acre, because I consider if it was untouched by the Company I could get that for it for building purposes. There are now plenty of factories and houses building there where persons never thought of building a house before. They are certainly on the other side of the railway, but the Prince Regent road from Silva's wharf was always a public road until the Company shut it up. The usual price of land for agricultural purposes is £2 10s., £2 15s., and £3 per acre. I do not think the well and other values of the marsh lands are 25s. or 26s. per acre. The value of marsh land has gone down within the last ten years.

Re-examined.—Although the value has gone down for agricultural purposes, it has gone up for building purposes. Taking the ground at £3 per acre for agricultural purposes is no criterion of its value for building purposes. I have sold land at £350 per acre for building purposes, and £400 for other purposes.

By the ATTORNEY-GENERAL.—The land I refer to is at Hornsey. I sold sixteen acres of a triangular form to the New River Company, to enable them to enlarge their reservoir. The other was at Mount Pleasant, Hornsey. I don't know what it was wanted for, nor anybody else; it was bought by a Quaker, and they never ask or answer any questions (a laugh). I never sold any land in the marshes. In the heart of the marshes there is no building going on whatever.

Mr. WILLIAM PONSFORD examined.—I have been employed by the Eastern Counties Railway Company as their land valuer for ten years. I have known this land for that period. It was at first determined to have a railway from Stratford to the river Thames, to be called the Thames Junction Railway. I valued the land then, and there is no question its value has since increased. Land which the Eastern Counties paid £700 per acre for has realized £1,000. The population in this neighbourhood has increased as fast as the houses have been built. I have seen Mr. Eve's lands, and they are the best cultivated. The fair price for them—allowing 25 per cent. for compulsory sale, £5 per acre for loss sustained at the Ockenden Farm, and £500 for probable loss in seeking new investment—would be £26,110 16s. 5d. I have made my calculations upon the basis of the premium tables of the Northampton, Carlisle, Equitable, and Government Annuities on the life of a person aged 50 years. The witness went into another calculation as to the value of Mr. Eve's interest in the brick-earth, &c., and which resulted in his fixing the amount of his claim at £29,451.

Cross-examined.—I was not concerned in the disposal of the property for £1,000 to the Eastern Counties Railway. It was at Bow Creek, with a river frontage, forming the river wall. I do not know that a person paid £36 per year under a long lease. I think the company paid £700 an acre for additional land which they required for their station. I do not know that no land produces so low a sum for the purchase money in proportion to the rent paid as marsh land.

THE ATTORNEY-GENERAL.—Then I will supply you with the reason. The stock may be easily removed, and then the owner has no security for his rent. Don't you know, that when the land is let upon lease, it is usual to deduct the occupier's interest? Now, suppose Eve had let this land upon lease for 17 years, would you not deduct the tenant's interest instead of adding it on?

Witness.—If you had to dispossess the lessee you would have to pay him his money. I have assumed the value of the tenant's interest at £5 per year beyond the rental. I was told the outgoings were certainly within £1 per acre.

Now, if a man was 21 years of age, should you calculate his interest according to the premium-tables you have referred to, and give him 25 per cent. interest for compulsory sale? Yes, I should.

And at what number of years should you average the period of his life? I should give him 39 years.

You are enunciating a principle which in all sincerity I declare I never heard of before in my life. Now, sir, tell me whether in estimating this sort of thing you have taken into your calculation whether the party is of hale, sound, and bodily health, or in delicate health, with a tendency to consumption? I should be no judge, probably, of that; but I can tell you the state of Mr. Eve's health. Of course in other cases some allowance would be made.

Did you ever know an instance in the whole course of your experience, where the owner and occupier is the same person, that the interest of the owner was calculated upon the life of the occupier? I never knew of such a case as this before.

No, nor I; but did you ever know any case of compensation being paid to an owner and occupier which was founded on the proposition you have laid down? No, I never have.

Cross examination continued.—In fixing the Royalty at 2s. 6d. per 1,000 bricks, I have taken no pains to inquire about London what is paid; but I know 3s. per 1,000 is paid at Brentwood. I have discussed these matters with other surveyors. I met them at Mr. Rawlings' office, for the purpose of having a consultation with them. My estimate was not then made. There was no difference as to principle. I suggested this proposition of the life of a tenant.

By Sir F. THESIGER.—I should value the owner's interest upon the life of the tenant and on the rent, and after that the perpetuity; and I should value the tenant's interest upon the profits of his occupation, and in doing so should deduct the rent he paid.

The Foreman said the jury perfectly understood the principle. Mr. GEORGE ALFRED DEANE examined.—I am architect and surveyor to Prince Albert, Lord Leicester, and Lord Harris, and am now farming about 500 acres for Lord Harris in the Isle of Sheppy. I am in the habit of being consulted by His Royal Highness about the Royal Farm at Windsor. I know Mr. Eve's farm at North Ockenden. He is in the habit of farming a great quantity of stock, and I consider his judgment second to no man's. I am sure his farming operations will be considerably crippled by his deprivation of his marshes. He is enabled at present to keep a large quantity of stock at Ockenden. One of the chief essentials in farming is to keep up a large quantity of stock, as it is productive of luxuriant crops and roots from the manure. I know from Earl Fitzwilliam—

Sir F. THESIGER.—I am afraid we cannot speak of other cases. Be so good as confine yourself to the present.

Witness.—I know the value of land in the marshes. It has become very valuable in consequence of the erection of the pavilion and pleasure-gardens at North Woolwich. I have purchased land in the neighbourhood at a profit of 50 per cent. I made an offer of £400 per acre to French for some on behalf of the Conservative Land Society. The fair value of Mr. Eve's land is £350 per acre; and I have advised him not to take less. I feel perfectly satisfied that if he was allowed to retain it for a few years he would get a much larger sum. I made a calculation of the value of the brick-earth, and am of opinion he is fairly entitled to receive £25,474. The offer for the land belonging to Mr. French, which I made on behalf of the Conservative Land Society, is near the iron bridge. I was also instructed to purchase Mr. Eve's lands, and I offered him £350 per acre, but he refused it.

Cross-examined.—The whole of the land in the marshes is accommodation land. I let about an acre to the public-house, and received £1 per acre for it as accommodation land.

Sir F. THESIGER called for the claim sent in, which was

admitted. The learned Counsel said that that was the claimant's case.

The ATTORNEY-GENERAL then rose to address the Jury, and observed that, notwithstanding his learned friend had endeavoured to drive him to call witnesses for the purpose of glossing over any observations he might make, and thereby leave his friend's witnesses unprotected, he did not think it was necessary to do more on behalf of the company which he represented than to leave the case where it stood. He must say the present claim was the most outrageous, grossest, and extravagant one that was ever submitted to a jury. Of all the cases of the kind that had ever come under his notice, and they had been numerous, he had never heard of one so ridiculous and preposterous. They had seen the place. The company were quite satisfied to meet Mr. Eve on the principle of taking the land as agricultural land. They were also willing to give him fair and full compensation, because they were taking it forcibly from him; although it was required, as his learned friend had said, not for the benefit of the company alone, but for the benefit of the public. They all knew the great advantages which these public undertakings conferred, and the increasing prosperity which railways and docks bestowed upon the neighbourhoods whence they came. They were like the rivers, which irrigate and nourish the lauds through which they passed. They brought additional public conveniences, comforts, and public advantages. He had no ground of complaint to make on behalf of the company for the way in which the case had been opened, but his friend had told the jury that the company were bound to take the advice of their experienced and responsible advisers. They had done so before they made an offer which was to be the basis of litigation. Their own interest and sound policy influenced them to make an offer that was fair and reasonable; for, in case of failure, they had to pay the claimant's as well as their own expenses. Now, the offer the Company had made Mr. Eve was £10,500, and the question before the jury was, whether that was a just and reasonable one? Let them see what this marsh was worth as applicable to grazing purposes; let them go by steps—first, what was he entitled to for rental? and next, what for compulsory sale? They would find, in the end, that all the data and wonderful calculations which had been put before them came to the same result. This was not a question of a small isolated marsh; but it was compensation for 61 acres out of 2,000 acres. It was very true, that in one particular isolated spot they found that as much as £12 per acre was paid as rental for land adjoining a public-house, which was used as a garden and pleasure-grounds, for persons to drink their ale and smoke their pipes in; but, taking the value of these 61 acres at £5 per acre, and the outgoings at £1—which he believed were much more—the utmost stretchable value of the land

would be £1 per acre. Then, what ought Mr. Eve to receive? The Company took it at 30 years' purchase, but his witnesses took it at 33; a though it was difficult to divine why they should put on the odd three years, as it had always been customary to take such land at 30 years' purchase. They should bear in mind that the value of such lands had not increased, in consequence of the increased accommodation by land and sea, the heavy consignments of dead meat from Scotland, and the large importations of cattle from foreign countries. The graziers could now put their fat beasts on the rail and send them up to market, and do not want the accommodation they formerly did. To tell him, therefore, that £4 an acre was not an abundant price for this as agricultural land was absurd, and such statements could only be received as coming from prejudiced and interested witnesses. As to the compensation to be paid for the compulsory sale, no Company had a right to tell a man to turn out—every subject of the realm had a right to say "Pay me something for the invasion of my rights." He would say, therefore, on this point, give Mr. Eve twenty per cent.; and the Company, in order to convince the jury that they were inclined to act with the greatest liberality, before coming into court they had considered what he was entitled to receive for his interest as an occupier. Now, although the railways had gone on for more than twenty years, and cases of this description had occupied the attention of juries in every county, he would undertake to say that so monstrous and preposterous a proposition was never heard of before to-day by any living human being, as Mr. Ponsford had had the unblushing effrontery to make. The Company proposed to give full, fair, and ample value in hard cash, plus the injury for compulsory sale, so that Mr. Eve could go into the market and purchase another estate forthwith; and yet they were told they were to pay him for the employment of his capital, perhaps with greater, if not equal, advantage, in another place.—The learned Counsel then at great length dissected the evidence of the witnesses *seriatim*—ridiculed the notion of converting these miasmatic and filthy swamps into habitations for human beings, and called upon the jury to throw aside all the unsubstantial exaggerations and amplifications which had been grafted upon the facts, and by their verdict protect the company from the extortion which was sought to be practised upon them.

The Learned DEPUTY SHERIFF briefly summed up, and the jury, after an absence of above an hour, returned into court, with a verdict for the claimant. Damages, £18,000.

The inquiry excited the most intense interest in the neighbourhood, and the court was inconveniently thronged throughout the protracted proceedings by anxious listeners, who signified their approval of the verdict by applauding the jury at the termination.

## CALENDAR OF AGRICULTURE.

The sowing of all grain crops must now be finished as fast as possible, and also lucerne and flax seed. Finish the preparation of grass meadow grounds. Sow vetches and grass seeds on wheat stubbles and barley tilths. The surface of winter wheats will be rough and stale. Harrow it before sowing the grass seeds, and again after the seeds are sown, and roll with a heavy weight.

Get prepared as quickly as possible the green crop lands; and towards the end of the month sow beetroot in drills well dunged, and 28 inches apart. Steep the seeds in solutions and lees, and dry with quicklime. Plant potatoes in drills 30 inches apart, and well-dunged with farmyard manure in a half rotted state; use strong sets, newly cut; very moist manure and in a large quantity; cover the drills

quickly, and roll them down. Before the land is drilled, use quicklime at the rate of 200 bushels an acre, and spread it evenly, and harrow it into the soil immediately; or strew the hot cinders evenly over the ground, and the subsequent workings of the land will mix the lime, which will be powdered by the dampness of the soil. This new mode requires an earlier application than the old method; but it must be very beneficial to the land, by reason of the damp and moist exhalations that will be evolved by the dissolution of the lime-shells.

Early crops will now require both horse and hand-hoeing, as carrots, lucerne, wheat, beans, and peas.

Paring and burning land will now proceed

vigorously; burn the sods moderately to a black torrifed mass; as in that state it will contain most carbonaceous matter. It is the best method yet known for bringing into cultivation all lands that contain much fibrous, inert, and ligneous matter.

Burn, for application by the drop-drill, rough earthy and vegetable substances found on road sides and ditch banks; also moss, and all combustible substances. The ashes will raise good crops of turnips.

Rye and watered meadows, winter barley and vetches, will now be ready for soiling cattle in the yards, and for being consumed on the ground by ewes and lambs. The food is best used by being cut and put into racks, and the racks moved regularly over the mown ground.

Fold the sheep nightly on the cleaned space, allowing in the fold two square yards to each animal, and two nights in one place. All bare grounds and inferior grass land may be much improved by folding the sheep upon the surface.

The lambing season will now draw to a close. When beetroot and cabbages fail as food for the ewes, use oats and bruised oil-cake mixed, and a portion of salt. Remove the stronger lambs to the pasture field.

Attend to the milch cows, and the suckling of

the calves. Give the former an ample allowance of juicy food, natural or prepared; to the latter as much milk as they can take. When begun to be weaned, at the end of 16 weeks, give them in racks, in the calf pens, young vetches, bruised cakes, bean and barley meals boiled, and linseed jellies. Give them a lump of chalk and of rock-salt to lick. The latter substance will quicken the action of the digestive organs, and the former will correct the crude acidities of the stomach.

The last remaining fattening bullocks will be sold during this month. Use oil-cake in finishing the animals. The most backward in condition will go to grass.

The season of curing bacon being over, all pigs on hand must go on for summer stores, and come in for early winter fattening. The earliest fat lambs will now come in for sale.

During wet weather, carry all the dung from the cattle-yards to the heaps in the fields, and litter the yards afresh for the summer soiling of cattle and horses.

Prepare by ploughing, harrowing, and rolling, the fallows for green crops, keeping most forward the portion to be sown with Swedish turnips next month. Plough clay lands for wheat fallow.

## CALENDAR OF HORTICULTURE.

### GENERAL REMARKS.

As the old weather does not seem inclined yet to leave us, the means so often recommended to avert its evils must be put in requisition; for as the spring advances, the inability of plants to endure cold increases. It is therefore important to preserve the bloom of fruit trees and the foliage or stems of tender plants from its virulence, by such means as will afford them the shelter they need; and in order to do this effectually, and without injury to the plants protected, the covering-up materials must be so contrived as to be removed easily in the day-time. In a spring so unusually severe as this has been, and up to the time we write—the 24th—promises to be, many operations will necessarily be delayed a whole month. Cauliflowers that have been under hand-glasses all winter are yet unable to endure the cold without them; while planting-out such things has been out of the question in many places at the usual period. All we can do is to urge patience and carefulness, and when the time comes, assiduity, on the part of our readers; at the same time impressing on them the importance of getting all work done that the season will allow, and other work will follow in due order when the weather becomes more favourable.

### CONSERVATORY.

The increased daylight, as well as the growth of many plants stationed here, must be met by their being allowed a liberal quantity of water, as well to promote a humid atmosphere as applied to the roots. At the same time, the former must not be charged with it so as to assume the character of steam, otherwise plants in bloom will suffer accordingly. But even these will benefit by a

certain amount of humidity. Means must be adopted for obtaining that, in order to counteract the tendency that fire-heat has to rob the leaves of those juices they cannot well spare, and consequently prepare them for that inroad of diseases which disfigure them so much, and encourage those pests of the insect tribe, of which the "red spider" is a type. Air must also be admitted in more abundance than heretofore as the season advances. Remove Azaleas and Camellias to a warm close house if that can be done, in order to promote their growth, as well as to allow room for other plants taking their place, of which there will now be abundance. Take care, also, to remove all other plants as soon as they show signs of decaying beauty.

### OTHER PLANT HOUSES.

It would be improper to give like directions for the management of all the plants which are occasionally inmates of the conservatory, because the tender and delicate stove-plant, as well as the robust hardy one, is alike placed there, as the case may be. Therefore, in the stove, we say, keep up a more moist heat than heretofore, and re-pot all plants requiring it, just prior to their commencing their summer growth. As an example of this class we may mention the old, but ever useful *Lagerstræmia indica*, which, being partly shrubby and deciduous, may be treated in winter much like a *Fuchsia*. Set it into some cool place for some months; when brought out again, let the top be pruned in, and the plant shaken out of its pot, and most of the soil removed, the roots pruned, and the plant put into a pot much less than its original one, and when placed on a hot-bed, with a good circulation of fresh air, it will keep the top-shoots from getting too weakly. The



plant will speedily grow, and will want re-potting once or twice during the summer, and early in October will form one of the most attractive features of the hothouse. Analogous to this there are a great number of our most ornamental stove-plants; and all of them have more or less a period of growth and one of rest, and must be treated accordingly. Different from this is the mode of treating the denizens of our ordinary plant-houses, which simply require protection during inclement weather. To these the heat and close humid atmosphere of the stove would speedily prove death, or what would be equally unfortunate, cause a weak, spindly growth of wood, incapable of producing a vigorous bloom. It is here that a free circulation of air, amounting to an almost total exposure, is required, so as to solidify the growth that takes place, and harden them so as to enable them to endure the changes our climate is subject to. Heaths and Epacris require an elevated stage, where the air may circulate freely amongst the pots they are growing in, as it does on their native heights; while they are impatient of the fire-heats our ordinary conservatory plants are treated to, in order to save the stove plants placed there. Houses of such plants as these, therefore, require all the air that can be admitted; and even its sharpness does them little harm; and whatever may be said of the evils of "cold currents" elsewhere, in the "Heath-house" they are useful rather than otherwise. Let them, therefore, have it in abundance: at the same time, those plants which have been blooming during winter had better be partly cut back, and the old blooms picked off, and the plants re-potted if they want it—taking care, in cutting back the Epacris, to do so more severely than to any of the Heath tribe, as it blooms only on the shoots of the previous season, and then it hardly allows of being trained to any particular shape; so that it is advisable to cut them with a view of the young shoots forming a nice compact head, without much artificial training or tying in.

**Pinery.**—Fruit now ripening must have all the sunshine possible, and water must be entirely withheld, except in the form of a humid atmosphere, which is to a certain extent admissible, in order to keep up the growth of suckers, with which we suppose the plant to be surrounded, and which we expect will be wanted for future plants. Water may now, however, be more freely administered to all successional plants that are in a growing state; and even the nursery ones—*i. e.*, those merely the offspring of what in gardening phrase are called "Gill-suckers" (a small side-shoot at the base of the fruit), may likewise have an additional supply of water as the lengthening of the days and other things tend to have a drying effect. Occasional syringing will also be necessary; but heavy deluges of water filling the centre of the plant, at times when evaporation is tardy, are both at variance with the laws of nature and successful practice.

**Vinery.**—Tying up, thinning, and the other routine work recommended in the late calendars, will be all required still in the various houses as they succeed each other. In the earliest ones, or those progressing to a ripening condition, less water and more air will be needed, in order to hasten this process, with a due regard to the quality of the produce as well. See that the houses intended for the latest crop are not too much crowded with plants, for whose welfare it not infrequently happens that a less amount of air, and corresponding increase of warmth, has brought the Vines to a state of forwardness unequalled for the position their crop is expected to occupy, which is to cut fruit at Christmas and after. If these have not hitherto been subjected to a full exposure, give them all the air that can be administered prior to their

bursting their buds, and they will of their own accord come into use without the aid of fire-heat, provided the border and other things be what they ought.

**Peach House.**—Syringe, tie-in, and thin, as recommended last week; and where the house is partially filled with other things, let them be removed as soon as possible. Keep up a healthy atmosphere, with a minimum heat of 50 deg. by night, advancing to 70 or 80 deg. by day. Water the borders when needed, and the paths, &c., may frequently be sprinkled, to keep up a nice humid heat, so necessary to keep away the "red spider."

**Cucumbers and Melons.**—Hitherto the season has been very adverse for these; but we hope to have fine weather soon, as, notwithstanding the cold we have had, we have also had it dull and gloomy as well, thus denying these tender plants the cheering influence of sunshine, so necessary to their well-being. Keep up linings to beds in action, and prepare dung. Sow more seed. Pot plants off, requiring it; and do all other needful work for the welfare of the future crops which may be wanted; and do not neglect the progressing ones by delaying the filling-in of additional soil, and the other things requisite to their welfare.

#### FLOWER GARDEN.

The frosts have been serviceable in pulverizing and mellowing down the beds that had been dug; so that we may reasonably hope for a less quantity of insects and other vermin than is usual after a mild winter. Continue the covering to Tea and other tender Roses, and other plants preserved thus far, and keep on propagating all plants wanted for the future, as, be assured, the lack of plants in that department will be less easily made up where it is no longer possible to substitute hardy ones for them, they being by reason of the severity of the season scarce likewise.

#### KITCHEN GARDEN.

Continue to plant, sow, and dig as recommended in former calendars, all of which operations may have been retarded by the weather; and after the frosts or heavy rains of the spring may be expected to be over, let the garden-walks everywhere have a good rolling, adding fresh gravel, if necessary, and there is every likelihood of their looking well the whole of the season. A mass of work will now require doing, all or most of which is of a kind well known to every one, and which want of space prevents our enlarging on here. Suffice it to say, that most kitchen-garden vegetables require now to be sown, others planted out, and several ones—as Peas and Beans—sown earlier staked; and, in fact, there is scarce an occupant of the kitchen-garden but which requires a something done towards producing it at this important period.

N.

**IMPORTANT SALE OF BARK.**—At the sale of the Government bark in the different Royal Forests, which took place on Thursday, the 3rd inst., at the Auction Mart in London, the prices ruled from £2 to £3 17s. 6d. There were two or three lots sold. Of the six lots in the Forest of Dean, two brought £2 17s. 6d., three £3 10s., and one £3 12s. 6d. The plan of rickling is not thought by those in the trade to have been successful.

**AUSTRALIAN WOOL.**—We have been favoured with the following extract from a private correspondence, dated Sydney, 18th Dec.—"I should think that only about one-fourth part of the wool has arrived this season that there was at the same time last year, and high prices have been paid for it. There is no doubt but there must be a great falling off in the export of wool from this colony and Port Phillip; and although there has been so large an influx of ushers into the colony, labourers are getting as high wages as before."—Leeds Mercury.

## METEOROLOGICAL DIARY.

Day.	BAROMETER.		THERMOMETER.			WIND AND STATE.		ATMOSPHERE.			WEAT'R.
	8 a.m. in. cts.	10 p.m. in. cts.	Min.	Max.	10 p.m.	Direction.	Force.	8 a.m.	2 p.m.	10 p.m.	
Feb. 23	29.65	29.45	31	40	29	W.N.W.	rising	cloudy	cloudy	fine	snow
24	29.72	29.47	29	36	32½	N. West	lively	cloudy	cloudy	cloudy	fine
25	29.45	29.80	32	38	32	North	ditto	cloudy	sun	cloudy	fine
26	29.25	29.22	30	38	35	W. by S. & N.	forcibl.	cloudy	sun	cloudy	wet
27	29.45	29.71	30	36	29½	Northerly	lively	cloudy	sun	cloudy	snow
28	29.86	29.86	24	39	31	N. by West	gentle	fine	sun	fine	dry
Mar. 1	29.75	29.64	28	35	32	W.S.W.	calm	cloudy	cloudy	cloudy	sleet
2	29.50	29.45	29	41	35	N.N.W.	gentle	cloudy	cloudy	cloudy	rain
3	29.83	30.06	29	38	31	N. Easterly	do., va.	fine	fine	fine	dry
4	30.07	30.02	26	43	38	S.W., Westerly	calm	fine	sun	cloudy	dry
5	29.88	29.83	33	50	43	S. West	ditto	cloudy	cloudy	cloudy	rain
6	29.90	29.92	42	52	47	Ditto	ditto	cloudy	fine	cloudy	dry
7	28.94	29.06	42	59	41	Ditto	ditto	cloudy	cloudy	fine	rain
8	29.97	30.05	37	47	42	S.S.W.	ditto	fog	cloudy	fine	rain
9	30.14	30.18	30	40	39	South	ditto	fog	sun	cloudy	dry
10	30.14	30.20	36	54	39	S. by East	ditto	fine	sun	fine	dry
11	30.20	30.10	31	56	39	E. by S., by N.	var.	fine	sun	fine	dry
12	30.06	29.97	33	59	42	E. by N.	lively	fine	sun	fine	dry
13	29.86	29.70	35	60	48	S. by E., West	gentle	fine	sun	cloudy	dry
14	29.58	29.63	37	45	38	S. West	var.	cloudy	cloudy	fine	rain
15	29.64	29.60	32	52	40	Southerly	gentle	fine	sun	cloudy	dry
16	29.59	29.60	36	40	34	N. East	ditto	cloudy	cloudy	cloudy	rain
17	29.79	29.88	29	32	28	E.N.E.	lively	cloudy	cloudy	cloudy	snow
18	29.90	30.09	25	33	26	Ditto	brisk	fine	sun	cloudy	dry
19	30.09	30.12	23	38	31	North	gentle	cloudy	sun	fine	snow
20	30.12	29.98	25	43	32	N., or by W.	ditto	fine	sun	fine	dry
21	29.81	29.80	27	41	33	S., S.W., East	var.	cloudy	fine	fine	snow
22	29.81	29.86	27	42	33	North	gentle	fine	sun	fine	snow
23	29.76	29.83	28	39	29	N. Easterly	lively	cloudy	cloudy	fine	snow
24	29.77	29.80	26	37	25	E. by N., N.E.	ditto	cloudy	cloudy	haze	snow

## ESTIMATED AVERAGES OF MARCH.

Barometer.			Thermom't.		
High.	Low.	Mean.	High.	Low.	Mean.
30.77	28.87	—	66	24	48.9

## REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
43.43	31.4	37.42

## WEATHER AND PHENOMENA.

Feb. 23. Thawing at noon.—24. Finer; cold, and sleet at night.—25. Lively, drying day.—26. Wind rising to hurricane, lulling late; snow first, then rain all day.—27. A hint of snow, clearing to a fineish day; at 4 p.m., a very large parhelion, on a vaporous sky.—28. Month ends fine, but very cold.

LUNATION.—Full moon on the 23rd, 7 h. 24 m. afternoon.

March 1. Sun in stratus clouds; sleet and rain.—2. Small drizzle, but much improved.—3. Pretty fine.—4. Solar power considerable; night drizzly.—5 to 10, inclusive. Variable as to weather, but alike in the all-but calm state of the air; upper and lower currents opposed nearly—northerly above.—11. Lively, fine day, till afternoon.—12.

13. Still fine; on the 13th, every modification of cirro-stratified and cumulus clouds.—14. Vast rain over-night: red, glowing sunset.—15. Overcast; changeable.—16. Gloom; chilly descent of drizzle. 17. Piercing, with small particles of snow.—18. Very fine; a few snow-clouds.—19. One short, dense fall of snow.—20. Equinox at 4, 24 p.m.; a change threatened then.—21. Cold wind every way, changing.—22, 23, 24. Generally fine, but with occasional small snow.

LUNATIONS.—Last quarter, 2nd day, 1 h. 40 m. afternoon. New moon, 9th day, 8 h. 19 m. afternoon. First quarter, 17th day, 11 h. 34 m. night.

REMARKS CONNECTED WITH AGRICULTURE.—Many days have been warm; but still, the cold nights and low averages prove that the month has been severe—at least 11 degrees below the usual temperature of the month. Let the meteorologist watch the indications of the equinox. The recurrence of small sprinklings of snow is remarkable. Rain has much abated; and it is probable that the ground has generally been open to the plough, and no complaints of seeding are made. Everything is backward; but it is to be hoped that the report of severe losses among sheep and lambs has its origin in fear, rather than fact.

Croydon.

J. TOWERS.

## AGRICULTURAL REPORTS.

## GENERAL AGRICULTURAL REPORT FOR MARCH.

Notwithstanding that the weather during the greater portion of the month has been very severe for the time of year, and that several rather heavy falls of snow have taken place, a fair amount of out-door labour has been performed. Still, however, field work is decidedly backward; and we regret to state that large breadths of land originally intended to be sown with wheat have not yet received the seed-furrow. This is much to be regretted, as it is possible that the aggregate yield will be comparatively small, without being productive of any material rise in the quotations to compensate the farmers for the trouble and inconvenience to which they have been lately put. The various markets have exhibited but moderate supplies of home-ground wheats; yet, owing to the continuous arrivals of foreign grain and flour, the corn trade has been in a very inactive state. In the general quotations no material change has taken place, although it is evident, from the large quantities of wheat disposed of, that consumption has been considerably in excess of some former seasons. The great scarcity and high value of potatoes have, of course, tended to give firmness to the demand in some localities; but we have had to report large arrivals of that root from France, from which country about 3,300 tons have been reported, and which have, to an extent, tended to check the quotations of English and Scotch qualities, which have been mostly exhibited in very middling condition. Fine malting barley has sold steadily at full quotations; but the value of grinding and distilling sorts has not been supported. In the early part of the month, about 4,000 brls. of flour were forwarded from London to Australia. The shipments, owing to the fall in prices at Sydney and Port Phillip, have since been almost wholly discontinued, although it is possible that they will be again resumed should the next advices be of an encouraging nature.

The stocks of guano in London, and at the various outports, have become much reduced. The demand having improved to some extent, prices have been on the advance, Peruvian qualities having produced from £9 5s. to, in some instances, £10 per ton. The quantity on passage to England is variously estimated at from 35,000 to 40,000 tons. In most other manures a full average busi-

ness has been transacted. The value of linseed-cakes has fluctuated; arising, chiefly, from the imports of seed having come to hand somewhat earlier than was at one time anticipated. However, prices have no doubt seen their lowest point, as the consumption of cake is now large.

The wool trade still continues in a very healthy state; English qualities in particular have commanded very great attention, not only for home use, but likewise for continental purposes. We understand that several large parcels have changed hands for shipment to the United States, where they are likely to come into competition with some of the Yorkshire woollen fabrics. It is possible that the quotations may yet go higher, as English wool is now largely mixed with colonial qualities in the production of goods. The Sydney ships lately reported have brought very moderate supplies of the article; although we learn that the whole of the last clip in Australia had been secured in the best possible condition, and without much additional outlay.

The markets for the sale of hay and straw have been somewhat active, and prices have had an upward tendency. The best meadow hay has realized £4 12s., the best clover £5 5s., and the best straw £1 16s. per load. On the whole the tallow market has ruled steady, although the supply has been equal to the demand. The rise in prices has been from 6d. to 9d. per cwt., and the stock of foreign in London at the close of the month was only 33,580 casks. The cattle trade has ruled very firm, and prices have been on the advance. Store sheep are likely to rule high during the whole of the present year. At present they are worth nearly as much as those fit for slaughtering purposes. The few fairs held of late have passed off briskly.

The butter market has continued to improve, notwithstanding that the supplies of Irish and foreign parcels have been on the increase. Fine weekly Dorset parcels have sold at from 104s. to 106s. per cwt. In Ireland and Scotland the cattle trade has been in a very healthy state, and prices have participated in the advance obtained in the London market. The shipments to England have increased to some extent, yet the supplies of stock have continued extensive. The great facilities afforded by railway communication have induced the graziers in the northern parts of Scotland to forward more than their usual supplies of beasts.

**REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.**

The immense amount of consumption in the metropolis and in the manufacturing districts, added to the unusually small supplies of sheep on offer, has been productive of much activity in the demand for each kind of fat stock, the prices of which have had a further upward tendency; indeed, this has been by far the dearest month we have had to report for a considerable period. We ourselves are in no way surprised at the present state of our markets, as we long since predicted that at no distant day the quotations would be on the advance—the result of the foolishly-adhered-to system of disposing of animals prematurely aged, and thereby destroying the numerical strength of the various flocks in the leading agricultural districts. The principal reason assigned in favour of early slaughtering has been the fact that two-year-old sheep, when disposed of, have paid the flockmasters better than those of three or four years old. It is true that in many instances they have produced an immediate profit; but we have no hesitation whatever in saying that, sooner or later, the system will become worn out, especially if the markets should continue high, and the breeders be in a position to withhold a portion of their supplies. What is the future prospect as regards prices? That the total quantity of sheep in England is much smaller than for a series of years past, does not admit of a doubt; and further, that whatever may be the amount of production in Holland—looking, of course, to the extent of the importations in most previous seasons—no material influence can possibly be exercised upon value. We have here referred more particularly to sheep; but, as regards beasts, calves, and pigs, we are fully impressed with the opinion that the currencies have seen their highest range for the present.

In several parts of the country most of the turnips have now been consumed, but the stock of hay is tolerably good; yet the latter article has improved in price, with every prospect of a further rise in it. The lambing season has passed off somewhat unfavourably. In some quarters heavy losses have been sustained, yet they do not appear to have exceeded those of 1851.

From our returns, it will be perceived that the importations of foreign stock have been in excess of the same period in 1852, whilst we may intimate that their general weight and condition have materially improved. Not the slightest difficulty has been met with in effecting sales; in point of fact, foreign stock almost invariably produces more money in Smithfield and elsewhere than animals of a similar quality bred in this country. The cause is obvious, viz., the immense quantity of loose fat

carried by both beasts and sheep, and which, as a matter of course, renders them so much more valuable to the butchers. Letters from Holland state that very large supplies of stock are being in course of preparation for the English markets; hence it is most likely that the importations this year will be on a very extensive scale. It is pretty generally understood that we shall have several imports from Spain, but the heavy expenses of freight have as yet left a serious loss to the importers. The arrivals during the month have been as under:

	Head.
Beasts .....	2,281
Sheep .....	7,384
Lambs .....	55
Calves .....	1,147
Pigs .....	17

Total ... .. 10,884

In the corresponding period in 1852, we received 6,747; in 1851, 8,381; in 1850, 6,004; in 1849, 8,034; and in 1848, 4,421 head.

The total supplies of stock shown in Smithfield have been as follows:—

	Head.
Beasts .....	19,228
Cows .....	360
Sheep and lambs .....	55,650
Calves .....	1,614
Pigs .....	2,780

**COMPARISON OF SUPPLIES.**

	March,	March,	March,
	1850.	1851.	1852.
Beasts .....	16,715	16,040	18,699
Cows .....	506	314	448
Sheep and lambs..	95,480	85,920	100,465
Calves .....	1,321	1,236	1,280
Pigs .....	1,881	2,184	2,629

From Norfolk, Suffolk, Essex, and Cambridge-shire, about 8,000 Scots and shorthorns have been received. The arrivals from other parts of England have amounted to 3,000 shorthorns, Herefords, runts, Devons, &c.; and from Scotland, 2,270 horned and polled Scots. The remainder of the supplies have been derived from abroad and the neighbourhood of the metropolis.

The highest and lowest prices paid have been as follows:—

Per slbs., to sink the offal.

	s.	d.	s.	d.
Beef, from .....	2	8	to	4 4
Mutton .....	3	10	to	5 4
Lamb .....	5	4	to	6 0
Veal .....	3	4	to	4 8
Pork .....	2	10	to	4 0

**COMPARISON OF PRICES.**

	March, 1850.		March, 1851.		March, 1852.			
	s.	d.	s.	d.	s.	d.		
Beef .....	2	4	to	3 8	2	4	to	3 8
Mutton .....	2	8	to	4 4	2	6	to	4 4
Lamb .....	5	0	to	6 0	4	8	to	5 0
Veal .....	3	0	to	3 10	3	4	to	4 6
Pork .....	3	0	to	4 0	3	0	to	8 10

Full average supplies of each kind of meat have been received up to Newgate and Leadenhall from Scotland and various parts of England; nevertheless, the general demand has ruled steady, at full quotations:—

Per lbs., by the carcass.		s.	d.	s.	d.
Beef, from . . . . .		2	8	to	3 8
Mutton . . . . .		3	6	to	4 8
Lamb . . . . .		5	2	to	6 2
Veal . . . . .		3	4	to	4 6
Pork . . . . .		2	8	to	4 2

An important feature in connection with the trade may be here particularly alluded to. We refer to the great rise which has taken place in the value of hides, skins, and wool. The advance has, of course, tended to improve the trade; whilst butchers in general have given the preference to sheep in the wool, under the impression that there has been every prospect of higher currencies, in which they have not been disappointed. Polled sheep skins have realized 11s. 6d., and shearlings 1s. 4d. to 1s. 6d. each.

## REVIEW OF THE CORN TRADE DURING THE MONTH OF MARCH.

During the period which has elapsed since we last addressed our readers, nothing has transpired to alter materially the view we then took of the probable future range of the grain trade. The northern ports of Europe have remained closed by ice, and the opening of the shipping season in the Baltic is likely to prove later than it has been for some years past. The absence of supplies from thence has however been little if at all felt, owing to the liberal receipts of wheat, Indian corn, &c., from the Black Sea and Mediterranean, and of flour from America, France, and Spain. The expected rise in prices of bread-stuffs has consequently not taken place; indeed, the tendency has, on the whole, been rather the other way. The best informed authorities appear to be uncertain how to act, and all parties have throughout the month conducted their operations with extreme caution. Supplies thus far have fully kept pace with the consumptive demand, and those who were the most sanguine in the commencement of the year regarding high prices have lost confidence in their own predictions. Circumstances have meanwhile occurred of a nature to strengthen rather than weaken the impression that the value of wheat may yet rise considerably. Owing to the extraordinary character of the season, it has been impossible to bring up the arrears of work, and the breadth of land sown with spring wheat has thus far been comparatively trifling. That sown in autumn is estimated to have been at least one-fourth short. The season is now so far advanced, that there is little prospect of this very serious deficiency being made good by spring sowings, and the probability is therefore that the next crop will be one of the smallest in quantity we have had for many years past, even if the summer and autumn should prove propitious. Such a state of things would formerly have sufficed to have given an impetus to trade; but, under existing regulations, it has been found that prices are

not dependent on the productiveness or shortcoming of our own crops, so much as on the extent of the foreign supplies; and merchants and speculators have therefore become very timid in their operations. The chances for and against a rise may be summed up as follows: Notwithstanding large foreign arrivals, and free deliveries of wheat from our own growers, since harvest, consumption has nearly kept pace with supply. Stocks of old wheat in farmers' hands were larger last autumn than was at that time supposed to be the case. This has been proved by the appearance of a portion of old at many of the provincial markets week after week, up to a very recent period. At length, however, the growth of 1851 appears to be exhausted, and we are decidedly of opinion that a larger proportion of crop 1852 has passed into consumption than is usually the case six months after harvest. Farmers therefore, we are inclined to think, hold less wheat altogether than in ordinary years at the close of March. This is, of course, to a certain extent surmise, it being impossible to obtain authentic information on this important point. The same, we are sorry to say, is the case in regard to stocks of foreign wheat; for after it has paid duty no further official account is kept of deliveries or stocks. Careful inquiries among the granary keepers and warehousemen at the various ports enable us, however, to come to something like an approximation; and our conviction is, that previous to the late arrivals from the Black Sea, stocks had become reduced into a narrow compass, and even now we do not consider them large, but we are approaching a period of the year when supplies from abroad usually increase. It is therefore quite possible that sufficient may come forward to prevent the indifferent result of the last wheat harvest in this country and the extensive loss of potatoes being felt; matters may therefore remain quiet enough, if nothing should occur to create un-

easiness in regard to the crop on the ground. The weather during the ensuing summer must, after all, decide whether we are to have a rise or not; but the position of affairs is such, that anything threatening mischief would be likely to have great influence, more especially as the foreign corn merchants are perfectly aware that we cannot do without large and regular supplies, and are sensitively alive to everything which may take place to give them a chance of obtaining more remunerating prices. The probabilities are, in our opinion, more in favour of a moderate rise than any decline; further than this, we are not disposed to venture on an opinion.

Though winter set in very late, hardly any frost having been experienced up to the close of January, the weather has since then been sufficiently severe, and as lately as the night of the 25th the thermometer marked 8 deg. to 10 deg. of frost. We had, however, an interval of very mild, almost summer weather from the 11th to the 13th inst.; and there is some danger that this short period of warmth, followed as it was immediately after by sharp frost, may have done mischief. Though the hardness of the ground has interfered (more or less) with spring tillage, a considerable amount of work has been done; but it is likely to be late before the whole is accomplished. A portion of the land originally intended for wheat will no doubt be sown with Lent corn; and the probability is, that quite the usual quantity of barley will be grown, as that has of late years been one of the best paying crops to the English farmer. There is not the same inducement to sow oats; still we are disposed to think that the shortness of the breadth of wheat will cause a somewhat increased cultivation of other articles, potatoes included.

We have been at considerable pains to collect information in regard to the aspect of the wheat plant, and are happy to say that, taking into account the unfavourable seed time, and the trying atmospheric changes to which it has since been exposed, the accounts are, on the whole, of a satisfactory character.

With regard to the future supplies of foreign wheat, much will depend on the extent of inducement which prices may afford. That the rise which took place in November last caused considerable purchases to be made in the interior of Germany, Russia, &c., by merchants at the various shipping ports, cannot be doubted; and a larger quantity will consequently be collected together at the different points from which we usually draw the bulk of our supplies than would have been the case if there had been no cause to believe that Great Britain would be likely to require large importations. The purchases then made were, however, entered

into at high prices, and it would not pay to consign at present. The wheat bought abroad during the winter months on British account will, no doubt, come forward whatever may be the state of affairs here; but comparatively few *bonâ fide* consignments are likely to be made by foreigners, until some margin offers for profit. The political involvement at present existing in reference to Turkey might, if not speedily arranged, interfere with supplies from the Black Sea; this is, however, a contingency which ought to be regarded only in the light of a possibility. That the stocks of bread-stuffs abroad are sufficiently ample to furnish us with supplies to make good any deficiency likely to be experienced between this and next harvest cannot be doubted—it will only be a question of price. Our wants could be easily supplied, even if they should prove greater than there is reason to believe they will, provided we are prepared to pay; but let it once become evident that we stand in real need, and foreign merchants will, like all other commercial men, make the most of their advantage.

Business at Mark Lane has been very quiet throughout the month; and though the arrivals of most articles into the port of London have been on a moderate scale, purchasers have in general been enabled to obtain all they have required, at somewhat reduced prices. The supply of English wheat has been small, and has been principally from the near counties—Essex, Kent, and Suffolk. The frequent changes which have taken place in the weather have acted injuriously on the condition, and this circumstance has naturally caused extra care and caution in making purchases. The very best qualities have not varied in value, such having been sought after; but all other descriptions have moved off slowly, though offered on relatively lower terms than the finer kinds. Prices were quoted 1s. per qr. lower for the general runs on the 7th inst., and a further depreciation to the like extent took place on that day week. On the 21st inst. there was some improvement in the condition, and the downward movement was consequently checked; since then there has been no quotable change. Opinion appears at present to incline to the belief that the point of the greatest depression has been passed; but this has been the case on several previous occasions since the commencement of the year, without having been followed by any marked rise. The principal millers are evidently afraid to hold much stock, owing to the very inferior quality of the new wheat, and the consequent danger of flour manufactured of the same going out of condition, in case the weather should set in warm. They would therefore not be benefited by any rise in prices; and it is, and has all along been, their policy to prevent an

advance. Foreign wheat has come sparingly to hand at this port, considering the magnitude of the arrivals off the coast; altogether only 21,000 qrs. have been reported since the close of February up to the 20th instant. There has consequently been no particular pressure on the market, and the downward tendency of prices of English during the first fortnight in the month failed to influence the value of the finer kinds of foreign. There has, however, been no inclination to enter into speculative investments; the country demand has been on a strictly retail scale, and the local millers have declined purchasing beyond what they have needed for immediate use. The transactions have therefore been unimportant; but even in this position of affairs, stocks in granary have undergone a diminution, and are certainly far from heavy at present. Though so small a proportion of the wheat arrived off the coast from the Black Sea and Mediterranean has found its way to London, the greater part of the cargoes has been sold in our market. The trade in grain with the Black Sea is rapidly rising in importance; this branch of business is almost exclusively in the hands of Greek houses established in the metropolis, and most of the contracts are closed here, though the destination of the cargoes may be the channel ports, Ireland, or Scotland. From the 27th of February up to the present time about 140 vessels, wheat-laden, have arrived off Falnouth and Queenstown. This large supply has had less influence on prices than might have been expected, and the sales recently made have been at rates only about 2s. per qr. below those current previous to the arrival of the fleet. Nearly the whole has been disposed of: for Polish Odessa prices have ranged from 38s. 6d. up to 41s., according to quality; and the finer descriptions, such as Marianopoli and Berdianski, have brought 42s. to 44s. per qr., cost and freight. There are still a good many cargoes on passage, but the market, having stood the brunt of the great supply, is not likely to be depressed by what may follow.

About the middle of the month, when the wheat trade was most influenced by the large Black Sea arrivals, the principal millers manifested a disposition to lower the top price of town-made flour, but the matter was not finally agreed upon; since then they appear to have come to a determination to let it remain as it has been for several months past, viz., 46s. per sack. That the receipt of rather large supplies from foreign countries has interfered materially with home-manufactured flour cannot be doubted; and country millers have felt the influence even more than town trade. Households have given way fully 1s. per sack since the close of last month, and have moved off slowly at the abate-

ment. Fine French flour may be quoted 36s. to 38s., and superior Spanish 40s. up to 42s. per sack. American has receded 1s. to 2s. per brl. Baltimore has in some cases been forced off at the low price of 25s. 6d. per brl., but could not now be had at that figure.

The supplies of English barley hardly kept pace with the demand in the early part of the month, and the best malting samples commanded extreme rates—say 36s. to 38s. per qr. Latterly the maltsters have purchased less freely, and the quantity brought forward having at the same time increased, a reaction to the extent of 1s. per qr. has taken place. This decline occurred on the 21st inst., and the demand has not improved since then. Distilling barley has scarcely varied in value, and nearly all that has been brought forward has been placed. The arrivals of this grain from abroad have been confined to a few cargoes from Egypt. The market has become quite bare of good heavy grinding samples; and though the season is now nearly over, and the consumption usually falls off at this period of the year, still thus far prices have been very firmly supported, good Danish and similar sorts being worth 28s. to 29s. per qr.

Malt was in lively request till within the last week or ten days; the inquiry has since somewhat slackened, but we consider prices quite as high as they were at the close of last month.

The total arrival of oats into the port of London during the four weeks ending the 26th inst. has amounted to only 47,000 qrs.; and of this quantity 32,000 qrs. have been from Ireland. Considering that stocks were previously low, and that the consumption of the metropolis is at least 20,000 qrs. per week, it is difficult to account for the want of activity by which the trade has been characterized throughout the month. The probability is, that the large dealers may for once have been rather out in their calculations, and they may yet have to become buyers on a bare market. They did not reckon on the frost lasting so long as it has, and expected that supplies to some extent would have reached us ere this from the near continental ports. They seem now determined to hold off as long as possible, but factors know perfectly well how they are situated, and will, if they have the opportunity, avail themselves of the advantage. Thus far, however, business has remained in a very dull state; and not only has no advance been established, but the tendency of prices has actually been the other way. The first Monday in the month (7th instant) found some pressing sellers of Irish; and where it was necessary to clear vessels coming on demurrage a decline of 6d. per quarter was submitted to. Very good qualities, weighing 40lbs. per bush., were on that occasion

old at 20s. per qr. Since then the anxiety to realize has decreased; but the disposition to buy has not increased, and it has consequently been impossible to recover the reduction which took place in the commencement of the month. At present good Scotch feed, 41lbs. weight, might be purchased at 21s., Irish at from 19s. to 21s., and foreign feed at rates ranging from 18s. to 21s. per qr., according to quality. The market has become very bare of the finer kinds of foreign feed, and no addition can be expected to be made to the same for at least a month. We may perhaps receive a few small cargoes from Dutch ports somewhat sooner, but no supplies of consequence can reach us till the end of April or the beginning of May. Scarcely any change has taken place in the value of English beans; the quantity brought forward has been small, the demand far from active, and quotations are almost precisely as they were when we last addressed our readers. Several cargoes of Egyptian beans have arrived during the month off the coast, and some of these have been ordered round to London, the effect of which has been some decline in their value, and at present floating cargoes might be bought at 27s. 6d. per qr., cost, freight, and insurance.

Notwithstanding the protracted frost, the inquiry for peas has been far from active, and prices have undergone little or no improvement, 40s. per qr. being still an extreme quotation for white boilers. Particular qualities suitable for seed have brought relatively high prices, and there is yet a good demand for sowing.

Floating cargoes of Indian corn were rather pressingly offered in the early part of the month, but those arrived off the coast have been cleared off with less difficulty than was anticipated; and within the last week or two sellers have manifested a disposition to raise their pretensions. There are now few arrived-cargoes unsold, and 32s. per qr. has recently been paid for fine Galatz.

The remainder of our space we propose to devote to a short notice of the state of affairs at some of the principal foreign markets.

We have already stated that the weather has during the greater part of the month been exceedingly severe over the whole of northern Europe; and the most recently received advices from the Baltic inform us that up to that period the rivers and harbours continued frozen up. The ice is described as so thick and firm as to resist the effects of the mid-day sun; and, as the mercury had fallen regularly each night many degrees below freezing point, it was calculated that it would require at least a week of rapid thaw to make any impression on the frozen water.

The latest letters from Danzig state that the pro-

habilities were that it would be impossible to commence shipments from thence before the middle of April; and the accounts from the Lower Baltic ports are to the same effect. Should this prove to be the case, no supplies of consequence would reach us for a month or six weeks; and we think our granaried stocks of fine wheat will by that time have become reduced into a very narrow compass. At Danzig the quantity of wheat is estimated to amount to about 150,000 qrs., of which probably two-thirds, or perhaps three-fourths, may be of suitable quality for shipment to England. Holders had not shown much disposition to give way in prices, the finer kinds more especially had been held with great firmness. The finest high-mixed had not been offered below 50s., mixed at from 43s. up to 46s., and damp ordinary kinds of mixed and red were quoted from 40s. to 42s. per qr. free on board in spring. The vessels in port had not been offered at a less freight than 4s. 6d. per qr. to London and the east coast.

At Konigsberg wheat was rather easier to buy about the middle of the month, but the most recent accounts from thence state that a rally had subsequently taken place. The opening of the shipping season is likely to be even later there than at Danzig. The arrivals from the interior had been short, owing partly to the immense quantity of snow which had fallen, many of the roads having become completely blocked up thereby.

At Stettin the fluctuations in prices have been considerable during the month. In the early part sellers seemed very anxious to enter into contracts for spring delivery, and business to a large extent was done at relatively lower prices than those current at neighbouring markets. These contracts were in many cases made by parties who were not in actual possession of the wheat, and who calculated on being able to procure it at lower prices before the time for shipment should arrive. Subsequently supplies fell off, and those who had made forward sales began to think they had acted somewhat prematurely; the effect of this was an improved demand, and by the latest accounts it appears that the decline which occurred in the early part of the month had been fully recovered.

At Rostock prices have not varied materially. Stocks there are not particularly heavy, and the greater portion being held by parties who have paid pretty high prices for the same, and entertain a good opinion of the future course of the trade, there have been no anxious sellers. The lowest price at which fine wheat has been offered there has been 44s. per qr. free on board in spring; and advices of the 21st inst. state that few sellers were inclined to enter into further contracts at that figure.



Hamburg letters of the 25th inst. report some abatement in the severity of the frost; the navigation of the Elbe was, however, so much impeded by ice as to be only practicable for steamers. The quantity of wheat bought there for English account during the month has been small, and the trade altogether quiet. Upland wheat, weighing only 60½lbs. per bush., had not been offered below 41s. 6d., and for good qualities from the Lower Baltic ports 43s. 6d. to 45s. per qr. had been asked.

In the Dutch markets prices have rather given way, though the supplies brought forward have not been by any means large.

In France flour receded more or less in value in the early part of the month, but recently the depression has again been recovered. A few parcels of flour have been shipped from that country to our markets; but as these have almost invariably left a loss, the consignments to England are not likely to be continued unless prices rise here.

From Marseilles a considerable quantity of flour is said to be on passage; this will, we fear, on arrival, give a very unsatisfactory account for the shippers.

The advices from the Mediterranean generally are of but little interest, and prices of wheat being relatively higher there than in the Baltic, hardly any purchases have been made of late in that quarter on British account.

The tone of the accounts from the Black Sea ports has become more subdued of late, owing to the less-encouraging reports from hence.

Letters from Galatz, of the 7th inst., state that the stock of wheat had been reduced to about 60,000 qrs.; and at Ibraila only 20,000 qrs. of good shipping quality remained on hand. Prices at the former place ranged from 24s. to 25s., and at the latter from 22s. 6d. to 23s. 6d. per qr. free on board. Freights were high, 14s. 3d. to 14s. 10d. per qr., with a gratuity for arrived ships. Vessels on the passage out might have been chartered 1s. to 1s. 6d. per qr. cheaper.

From America we have advices of recent dates. The continued dull accounts from this side had had considerable effect, and prices of flour began to give way early in the month; after, however, a decline of about 50 cents per brl. the demand had had revived. The latest quotations from New York range, for good brands of States flour from 4 d. 75 c. to 5 d. per brl. Shipments from thence to England had been rather considerable, and from the 1st to 8th of March 42,000 brls. had been exported. Freights to England had given way, charters having been closed for Liverpool at 2s. per British vessels, and 2s. 3d. to 2s. 6d. per brl. per American ships.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter	
WHEAT, Essex and Kent, white, new..	43 to 47	fine up to 52
Ditto ditto old ..	44	52 " 59
Ditto ditto red, new...	42	45 " 47
Ditto ditto old ..	41	48 " 52
Norfolk, Lincoln, & Yorksh., red..	42	47 " 52
Ditto ditto new ....	37	44 " 46
Ditto ditto white new, none ..		" —
Ditto ditto old none ..		" —
BARLEY, malting, new..	30	32 .... Chevalier.. 32 37
Distilling ..	28	30 .... Grinding.. 26 29
MALT, Essex, Norfolk, and Suffolk, new	54	55 extra 58
Ditto ditto old	52	54 " 56
Kingston, Ware, and town made, new	59	60 " 63
Ditto ditto old	57	59 " 61
OATS, English feed..	17	21 .... Potato.. 20 21
Scotch feed ..	20s. 6d.	25 .... Potato.. 23 27
Irish feed, white .....	17	19 fine 21
Ditto, black .....	16	17 fine 19
RYE .....	28	30 old 28 30
BEANS, Mazagau.....	33	34 " 31 35
Ticks.....	34	36 " 36 38
Harrow.....	35	37 " 37 39
Pigeon.....	36	40 " 40 44
PEAS, white boilers	37	40.. Maple 33 36.. Grey 30 35
FLOUR, town made, per sack of 280 lbs. —		" 41 46
Households, Town 40s. Country ..		" 36 40
Norfolk and Suffolk, ex-ship .....		" 34 35

FOREIGN GRAIN.

	Shillings per Quarter	
WHEAT, Dantzic, mixed..	46 to 47	high mixed 49 51 extra 57
Konigsberg.....	45	47 " 48 50 " 51
Rostock, new .....	48	50 fine old 47 49 " 53
Pomera, Meckbg., and Uckermk., red	46	48 extra 48 50
Silesian.....		" 44 46 white 46 48
Danish and Holstein .....		" 42 44 " 44 46
Rhine and Belgium.....		" 42 45 old 45 49
French.....		" 42 44 white 43 47
Odessa, St. Petersburg and Riga..		37 39 fine 41 43
BARLEY, grinding	24	28 .... Distilling.. 27 30
Malting.....		" none —
OATS, Dutch, brew, and Polands 19s., 21s. 6d. Feed 17s. 6d. 19		
Danish and Swedish feed 19 20.. Stralsund.. 19 22		
Russian.....	20	21 .... French.. 18 20
BEANS, Friesland and Holstein .....		32 35
Konigsberg ..	34	37 .... Egyptian.. 30 32
PEAS, feeding .....	35	36 fine boilers 38 40
INDIAN CORN, white.....	32	35 yellow 32 35
FLOUR, French, per sack .....	36	38 fine 38 40
American, sour per barrel	22	23 sweet 24 27

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS.												
		Wheat.		Barley.		Oats.		Rye.		Beans		Peas.
WEEK ENDING:	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Feb. 12, 1853..	45	2	31	5	18	5	30	11	34	10	31	2
Feb. 19, 1853..	41	6	31	1	17	9	29	3	34	5	31	2
Feb. 26, 1853..	45	2	31	3	18	4	30	4	34	5	31	6
March 5, 1853..	45	9	31	7	18	3	30	9	34	8	32	6
March 12, 1853..	45	8	31	9	18	6	30	9	34	4	32	9
March 19, 1852..	45	5	31	9	18	10	30	10	34	2	32	11
Aggregate average of last six weeks	45	3	31	5	18	4	30	6	34	6	32	1
Comparative ave. same time last year	42	7	30	5	19	5	30	11	30	1	29	9
DUTIES.....	1	0	1	0	1	0	1	0	1	0	1	0

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last Friday's Gazette.				Averages from the correspond ing Gazette in 1852.			
Qrs.		s. d.		Qrs.		s. d.	
Wheat....	90,268	45	5	Wheat....	85,125	42	8
Barley....	63,037	31	9	Barley....	56,365	30	3
Oats.....	21,419	18	10	Oats.....	21,765	19	9
Rye.....	127	30	10	Rye.....	73	31	11
Beans....	6,765	34	2	Beans....	8,161	30	4
Peas....	2,244	32	11	Peas....	1,813	29	10

## PRICES OF SEEDS.

## BRITISH SEEDS.

Linseed (per qr.)... sowing 54s. to 58s.; crushing 45s. to 50s.
Linseed Cakes (per ton)..... £8 0s. to £9 10s.
Rapeseed (per last) new £22 to £23, fine £24, old £21 to £24
Ditto Cake (per ton)..... £1 10s. to £5 0s.
Cloverseed (per cwt.)..... 44s. to 64s.
Mustard (per bushel) new, white 7s. to 9s., brown 7s. to 9s.
Coriander (per cwt.)..... old 9s. to 12s.
Canary (per qr.)..... 40s. to 42s.
Tares, Winter (nominal).. Spring, per bush, 5s. 6d. to 6s. 6d.
Carraway (per cwt.)..... new 46s. to 47s.; fine 48s.
Turnip, white (per bush.)..... Swede (nominal).
Trefoil (per cwt.)..... 26s. to 30s.
Cow Grass (per qr.)..... (nominal) .. 00s. to 00s.

## FOREIGN SEEDS &amp;c

Linseed (per qr.)... Baltic, 43s. to 46s.; Odessa, 45s. to 49s.
Linseed Cake (per ton)..... £7 10s. to £9 10s.
Rape Cake (per ton)..... £1 10s. to £5 0s.
Hempseed, small, (per qr.) 38s. to 42s., Do. Dutch, 40s. to 44s.
Tares (per qr.) ... old, small 25s. to 30s., large 30s. to 32s.
Rye Grass (per qr.)..... 28s. to 35s.
Coriander (per cwt.)..... (none) 00s. to 00s.
Clover, red (duty 5s. per cwt.)..... 40s. to 64s.
Ditto, white (duty 5s. per cwt.)..... 52s. to 70s.

## HOP MARKET.

## BOROUGH, MONDAY, March 28.

The business doing is inconsiderable in amount, but prices are maintained with firmness. The stock in hand of last year's hops is exceedingly small.

Sussex Packets..... 95s. to 115s.
Weald of Kents..... 100s. ,, 120s.
Mid and East Kents..... 112s. ,, 160s.

## POTATO MARKETS.

## SOUTHWARK, WATERSIDE, MONDAY, March 28.

During the past week, the arrivals both coastwise and foreign have been limited; and owing to the severity of the frosts, very few have come by rail, and a slight advance upon last week's quotations has been obtained.

The following are this day's quotations:—

York Regents..... per ton 110s. to 160s.
Lincolnshire ditto..... 90s. ,, 130s.
Scotch ditto..... 100s. ,, 130s.
Ditto Reds..... 90s. ,, 105s.
French whites..... 160s. ,, 115s.

## BOROUGH AND SPITALFIELDS.

The supplies of all kinds of Potatoes on sale in these markets continue limited, and in very middling condition. Owing, however, to the present high rates, the demand is in a sluggish state at our quotations. The imports last week were—95 tons from Rouen, 135 do. from Dunkirk, 118 do. from Calais, and 4 bags from Rotterdam.

York Regents..... 115s. to 155s. per ton.
Lincolnshire do..... 95s. to 125s. ,,
Scotch do..... 95s. to 120s. ,,
Foreign..... 95s. to 110s. ,,

## ENGLISH BUTTER MARKET.

## MONDAY, March 28.

We note a good trade at previous prices, but confidently look for lower rates when mild weather comes.

Dorset, fine, new weekly..... 104s. to 106s. per cwt.
Do, middling..... 90s. to 96s. ,,
Fresh, per doz. lb..... 10s. to 12s. 6d.

## PRICES OF BUTTER, CHEESE, HAMS, &amp;c.

Butter, per cwt.	s.	s.	s.	s.	
Friesland.....	102	104	Cheese, per cwt. Cheeshire 56	74	
Kiel.....	100	102	Cheddar.....	60	74
Dorset.....	108	112	Double Gloucester 60	68	
Curlew.....	96	100	Single do.....	51	62
Waterford.....	90	94	Hams, York, new.....	84	94
Cork.....	88	94	Westmoreland.....	89	90
Limerick.....	84	90	Irish.....	66	78
Stigo.....	82	94	Bacon, Wiltshire, green 64	68	
Fresh, per doz..	11	15	Waterford.....	62	66

## WOOL MARKETS.

## BRITISH WOOL.

LONDON, March 28.—The continuous advance in the value of colonial wools at public sale, the rapid extension of our export trade, and the prospect of a limited clip for the present year, arising from the shortness of stock in the country, have rendered this market one of primary importance to the farmer. In addition to the large quantities lately disposed of for home use, we have had heavy shipments of the article to France and Belgium, where it is worked up into low fabrics so generally worn by the peasantry. In the week just concluded, 90,000lbs. have been shipped to the continent, and other parcels are about to follow; hence, many of the holders are anticipating further enhanced rates, notwithstanding that shearing has now commenced in several parts of the country, and that, consequently, the supply will shortly be on the increase. Looking to the fact that the arrivals of foreign and colonial wool are not likely to exceed the demand—although the latest advices from Australia state the whole of the new clip had been secured in good condition—we see very little prospect of any decline in the quotations, especially as English wools are now more extensively used in the manufacturing districts than for a series of years past. South Down hoggets, half-bred ditto, and Kent and Leicester fleeces, are particularly firm.

## CURRENT PRICES.

	s.	d.		s.	d.
South Down Hoggets.....	1	3½	to	1	5½
Half-bred ditto.....	1	3½	—	1	4½
Ewes, clothing.....	1	1	—	1	2½
Kent fleeces.....	1	1½	—	1	2½
Combing skins.....	0	10	—	1	3
Flannel wool.....	0	11	—	1	4
Blanket wool.....	0	7	—	1	0
Leicester fleeces.....	1	1	—	1	2½

LEEDS, March 24.—Sales of wool this week have been to a considerable extent, and prices continue to have an upward tendency.

## LIVERPOOL, MARCH 26.

SCOTCH.—There is nothing new to report in any kind of Scotch; the stocks of all sorts are light, consequently transactions are necessarily limited.

FOREIGN.—There is a steady demand for all kinds of wool at very full rates.

## FOREIGN WOOL.

The market is firm.

The statistics of live stock, published at Sydney for eight years to the end of 1851, state:—

"Applying to the increase of sheep the same test as that supplied to the increase of horned cattle, the results are as follows:—

Last four years—	
Increase per table.....	2,220,000
Slaughtered for tallow.....	375,000
Exported.....	38,000
Total.....	2,633,000

Last four years—	
Increase per table.....	1,724,000
Slaughtered for tallow.....	1,121,000
Exported.....	64,000
Total.....	2,909,000

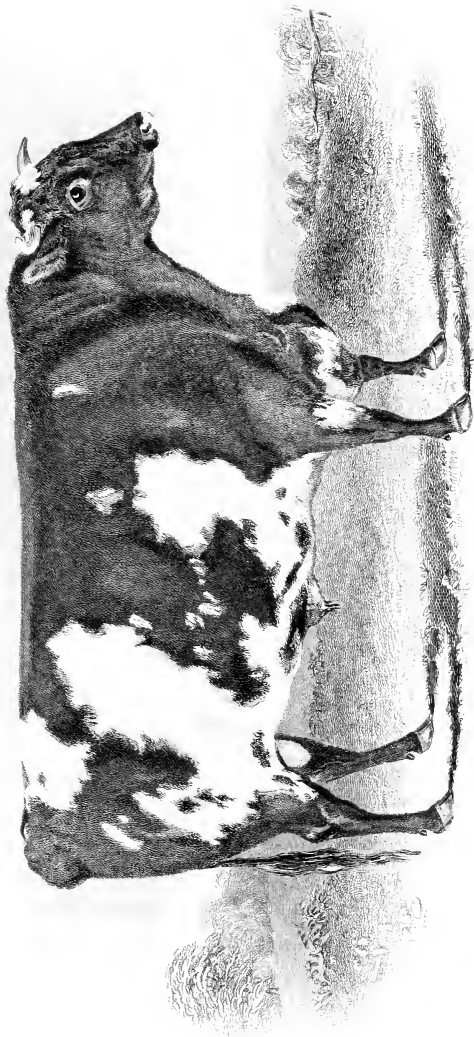
"So that the increase of the last four years was only about a quarter of a million above that of the previous four.

"The ratios of sheep to each hundred persons of the population, were—

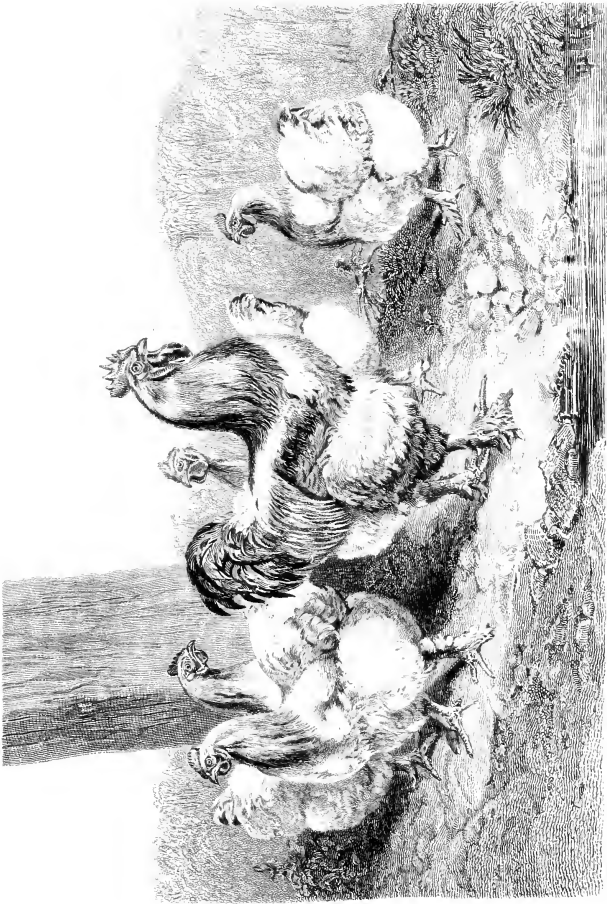
In 1846.....	3,178
In 1851.....	3,951

"It would thus appear that while the consumption of beef in the colony has about kept pace with the increase of cattle, the consumption of mutton is still considerably below the increase of sheep."









# THE FARMER'S MAGAZINE.

MAY, 1853.

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## PLATE I.

### A SHORT-HORNED BULL.

"GARRICK" (11507).

Red and white, calved September 19, 1849, bred by Charles Towneley, Esq., M.P., Towneley Park, near Burnley, Lancashire, the property of Messrs. Neil, Black, and Co., Port Philip, Australia; got by Gay Lad (9141), dam (Lavinia) by Prince Ernest (4818), g. d. (Lady Anne) by Ganthorpe (2049), g. g. d. by Rockingham (2550), g. g. g. d. by Bulmer (1760), g. g. g. g. d. by Don Juan (1923).

The following are the prizes obtained by this bull:—In 1850 he obtained a prize at the Bury Agricultural Meeting; in 1851, the first prize of £20 as the best yearling bull, at the Yorkshire Agricultural Society's Meeting, held at Burlington; also the first prize of £20 as the best yearling bull, at the Royal Agricultural Improvement Society of Ireland, held at Dublin; and also the first prize of £10 as the best yearling bull, at the Royal North Lancashire Agricultural Society, held at Lancaster, and was shortly afterwards sold to go to Australia.

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## PLATE II.

### COCHIN CHINA FOWL (BUFFS),

PRIZE BIRDS, THE PROPERTY OF THOMAS STURGEON, ESQ., MANOR HOUSE, GRAYS, ESSEX.

BY "A BREEDER."

The *Times*, before the Easter holydays, declared that excitement was nowhere to be found but among the cultivators of Cochin China fowls; and, without question, there is some there. Let anyone but look back four short years, and then, tomorrow, or any following day, glance at the advertising columns of the before-mentioned authority, and he will be convinced that a fresh subject of interest has arisen, a fashion been set, and a new, and not altogether ungrateful object for the expenditure of our time, money, and attention discovered. This is poultry keeping, in itself a relaxation, amusement, or pursuit, that now seems to embrace all classes. Any one can keep a fowl, that has a yard 8 ft. by 12 ft.; most of us like our eggs and chickens

OLD SERIES.]

more like some live thing to tend and protect; and these facts opening, as they do, so wide a field to competition and its consequent rivalry, must explain the sending of a pen of birds two or three hundred miles to take a forty-shilling prize: as well as individual birds realizing as many pounds at our constantly recurring sales. The origin of all this may be dated no further back than the introduction of the Cochin China fowl; their peculiarities seem to have attracted, and their great docility and valuable qualities to have riveted a pleased attention. Public opinion, that stamps the value on everything, whether it be the yard of cloth, or the physician's or the lawyer's services, seems to have declared in favour of the Cochins as a breed.

Difference of opinion undoubtedly exists; but that of the many-tongued cannot be mistaken, nor indeed of the tribe, of that race, that is most esteemed. For three successive years has Mr. Sturgeon's stock carried off the principal honours at Birmingham, the greatest of our poultry gatherings; and, although he has been found taking at the same meeting second and third prizes, he has never, either there or elsewhere, taken a second but when he got the first. Among his beautiful birds have we looked for our illustration of the Cochinchina fowl. Eggs in winter—and in profusion too—carcasses of 10lbs., a hardihood unequalled, tame and confiding in their habits, and never straying—certainly all these points combined form strong grounds for a favourable opinion, quite irrespective of the ease and advantage attending a disposition of the surplus stock.

For "points" in detail, we cannot do better than refer to the new Poultry Book; and as that authority takes two numbers to do justice to this fashionable subject, we must be content with advising our friends to look forward to the time when these birds shall be tried by their intrinsic merits; and, in their purchases, to insist on form, size, and consequent weight, coupled with the short leg and neck peculiar to the true breed, in preference to mere colour, which some now seem alone to regard.

I have kept Cochinchina fowls (I cannot yet accede to the change of name, and call them Shinghaes, until I see a much better reason than has yet been given) for a length of time, quite sufficient to enable me to speak of their qualities; and, as I have other sorts, I can bear my testimony also to their comparative merits. For those whose space is limited they are undoubtedly the birds; they are quiet and homely to a degree; mine will feed out of my hand, and frequently pick from the dog's pans. Any fence, moreover, will confine them, so little do they appear desirous of straying.

But I agree with those who contend that the true test is which breed possesses most advantages combined with fewest demerits; and here I contend that my Cochinchina friends have it hollow. Do you want new-laid eggs in the winter months, when they are scarce and dear? I know of no hens so likely to supply you. Are you desirous of rearing chickens? The Cochinchina are the best of mothers, and their progeny the easiest to rear of any breed I know. And when the time comes for putting them upon the table, is it no advantage that one

should weigh as much as the couple of olden times?

These, in a few words, are the results of my experience of the Cochinchina, looked at merely as a farm-yard fowl. Some persons will contend that a Dorking Capon is a better table fowl. It may be that he boils whiter, or even shows a plumper breast; still I doubt if he supplies more of juicy and wholesome meat. But, supposing that for this one quality the Dorking has the call in the London markets, when you get him there—does this counterbalance the eggs in winter, the extra number of chickens, and the hardihood of the race?

We are to look at the question as one of kind against kind; and "for all properties," I aver without fear of contradiction, that the farmer who rears good Cochinchina for their mere produce to sell for food, will make more profit of them than of any other known variety.

To the amateur, who rears his poultry partly for use and partly for amusement and ornament, there is nothing, in my opinion, to compare with them. The qualities I have before alluded to will alone gain for them the favour of those whose premises are confined, but who yet wish to have them occupied by such stock as they can support. At first sight, I readily admit that the Cochinchina, more especially the growing chickens, are not so pleasing to the eye as some other varieties; but the singularity of their appearance wears off upon acquaintance, and bearing rather a recommendation than otherwise, from the contrast. I do not mean those gaunt, gawky brutes, sometimes called Cochinchina, and which were first called Shinghaes; but the neat, squat, short-legged build of true Cochinchina fowl, such as Mr. Sturgeon has exhibited, and which have carried home the prizes to Grays from every quarter of the kingdom.

I have said nothing of the relative value in the market of this and other kinds at the present day; but to farmers and amateurs, those poultry-breeders who are not above disposing, after supplying themselves and their friends, of their surplus stock, with the view "to reduce the price of corn," there can be no question which is the most profitable of all known races of fowl.

I may add that I myself came to the consideration of this question with a strong bias in favour of the Spanish, which I have kept in their purity for many years; but I have really been compelled to arrive at the conclusion that the Cochinchina, whether for the farmer or the fancier, are, for all purposes, the "birds of the day."



## THE TURNIP PLANT.

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

I can perhaps hardly address myself on this occasion to any theme of more immediate interest to my readers, than to the growth of the turnip plant. When these observations indeed are read by the English farmer, the commencement of swede sowing will be close at hand. To promote the growth of these, to lay the foundation of more luxuriant and heavier crops, is surely then a question of peculiar interest to the agriculturist at the present season of the year.

It is with the same object, that of gathering practical knowledge as to the profitable growth of turnips, that the Lockerbie Farmers' Club have now for the last few years systematically pursued their valuable labours in the district of Annandale.

The report of their experience in the unfavourable turnip season of 1852 will be found in the present volume of the Transactions of the Highland Society, p. 545; and that practical detail will well repay the young English farmer, for a careful and repeated study, although, as the club truly remark in their report, the results of their enquiries will be of more interest to the farmers of the district, acquainted with the localities and soils of each farm, than it can be to strangers. For the information of those unconnected with Annandale, it may be proper to mention that the district in which these trials and weighings were made, extends about 25 miles in length along the valley of the Annan, in elevations from 100 to 800 feet above sea-level, the farms inspected being mostly between 200 and 400 feet, though this year several of the best crops are from 600 to 700 feet above the level of the sea.

The examinations were made on about 32 farms, and the average weight in tons and cwts. per imperial acre for the four last crops were as follows:—

	1849.	1850.	1851.	1852.
Swedes	21.16	24.9	19.16	23.7
Yellow	20.2	19.4	17.	17.7
Common	22.7	25.14	21.1	23.14

*The time of sowing.*—On the whole, these able Scotch farmers are still disposed to adhere to the opinions which they have formerly expressed, “that swedes should be sown from the 10th to the 20th of May, and that later than the 25th risked the weight of the crops; that white for consumption in September should be sown early in May, and again partially as the last sown of the season; that yellow should be after swedes, and as few as possible after

the 15th of June”—though certain members of the Lockerbie Club remark, “that on free and quick soils they would prefer a portion rather later, to insure nutritious food for sheep in spring.”

*Width of drill, and hoeing out.*—The width of the drill on the Annandaleshire farms is generally from 26 to 29 inches; but the opinion of many members seemed in favour of more discrimination. On level rich land, swedes well manured might be as wide as 30 or 31 inches; while on hard gravelly soils, and on exposed and steep fields, yellow might be in some cases only 24 or 25 inches. As to width of hoeing, although in some instances from the peculiarly early falling down of the leaves, narrower thinning seemed advantageous, yet on the whole the club adhere to their recommendation of 10 to 13 inches,

*Manure for turnips.*—It seems (adds the Lockerbie Farmers' Club in the valuable report from which I have already extracted so much), more and more clearly ascertained, that to farmyard manure alone, in quantities however great, extra manures should always be added, as increasing the weight at a cost far under the value of the extra produce; in fact, that no turnips should now be sown on land under ordinary rotation, without extra manure; and several members remarked, “that with the addition of guano, the crop did often as well with dung little decomposed, as with that more thoroughly rotten.” The club are also more impressed with the opinion that bones, either ground or dissolved, should in most cases, especially with swedes, be used with guano and lighter manures.

The selection of the best and most useful manures for the turnip, and indeed for all crops, is a theme, of all others, most interesting to the farmer. It is here, too, that the chemist so clearly and so usefully lends his aid. As I have in the Farmers' Almanac for the present year, p. 27, had occasion to remark—more than one distinguished chemist has, during the past year, materially added to our stock of knowledge in this way. Professor Voelcker has endeavoured (*Quar. Jour. Ag.*, 1852, p. 255) affix to a money value to the constituents of artificial manures; this will not be without its value to the farmer, although, as Dr. Voelcker remarks, from all articles of commerce being subject to considerable fluctuations, it follows that the subjoined list can have no permanent value:—

Every lb. of nitrogen in the form of ammonia, or nitric acid, may be estimated at.....	d.	8
1 lb. of nitrogen, in the form of nitrogenized matter, at.....		6
Organic matters, free from nitrogen, 18 lbs., at.....		1
Salts of potash 1 lb., at.....		1
or potash separately 1 lb., at.....		1½
Salts of soda 9 lbs., at.....		1
Phosphate of lime 1lb., at.....		¾
or phosphoric acid separately 1 lb., at..		1½
Gypsum 6 lbs., at.....		1
Lime 12 lbs., at.....		1

For all practical purposes, the determination of the value of the remainder of the substances which are usually indicated in the analysis of artificial manures, such as oxide of iron, alumina, silica, &c., may be entirely neglected. To aid the young farmer to apply this, the following table gives the amount in lbs. of the nitrogen, phosphoric acid, and lime, in 1000 lbs. of bone-dust, fresh cow or horse dung, and dry straw—

	Bone Dust	Dung	Straw.
Nitrogen.....	50	4	4
Phosphoric Acid	240	3	2
Lime.....	330	4	4

Bone-dust thus contains about 12 times more forcing substances, and 80 to 100 times more grain-forming materials, than dry straw or the excrements of cattle. There is no doubt that bone-dust is the best application, where immediate benefit is chiefly regarded. In Saxony 1 cwt. of bone-dust is estimated to be equivalent to 25 or 30 cwt. of farm-yard manure; but even in this finely divided state, the full benefit which they are capable of affording is not realized in the first year. Experience has shown that the benefit of such bones in a soil which is neither too retentive nor too loose lasts for about four years, and amounts in the

First year to... ..	25 to 30 per cent.
Second „ .....	25 to 30 „
Third „ .....	20 to 25 „
Fourth „ .....	10 to 15 „

The slowness with which the entire bone dissolves is shown by the analysis of some Roman bones buried near to Cirencester, probably 1500 years since. In the following table, column I. gives substances found in 100 parts, of II. the lower jaw of an ox; III. the molar tooth of an ox; IV., the tusk of a boar; V., the thigh bone of a man—

I.	II.	III.	IV.	V.
Organic...	11.77	8.41	18.12	3.62
Inorganic..	88.23	91.59	81.88.	86.38

Professor Anderson has been engaged in another important branch of the enquiry, viz., on the composition of the turnip grown on different soils, and with different manures. In the following table,

column I. gives the soil and crop; II., the water in 10,000 parts; III., the nitrogen in the fibre; IV., the nitrogen in the juice; V., the phosphates. The turnips were grown on the property of Lord Kinnaird, in Perthshire. The clay soil is the heavy alluvial clay of the Carse of Gowrie, which is a wheat soil of the best description. The hill land is a light loamy soil, of an entirely different character from the Carse clay, and lets at a much inferior rent. The black land forms the boundary between the two former, and partakes of the character of both, those of the clay, however, preponderating—

	I.	II.	III.	IV.	V.
Swedes in 1849.					
Clay land.....	9058.0	2.9	12.9	16.0	
Black land.....	9878.0	4.0	14.2	17.6	
Hill land.....	8712.0	1.7	26.8	15.9	
Swedes in 1850.					
Clay land.....	9273.0	3.7	8.6	9.6	
Black land.....	9278.0	4.0	5.9	9.0	
Hill land.....	9278.0	4.5	10.2	9.8	
Aberdeen yellows, 1849.					
Clay land.....	9119.5	3.6	15.9	16.2	
Black land.....	9047.8	3.8	13.7	16.7	
Hill land.....	9057.8	3.9	24.4	13.3	
Aberdeen yellows, 1850.					
Clay land.....	9426.3	3.1	7.8	6.8	
Black land.....	9059.0	2.9	13.8	12.17	
Hill land.....	9399.0	3.4	12.0	12.0	

In the next table will be found the results of some very interesting experiments made with yellow turnips, at Lord Kinnaird's farm of Millhill. The different turnips were all manured with 16 tons of farm-yard manure, valued at £4, and had, in addition, quantities of different auxiliary manures. In this table, column I. gives the No. of the experiments and the manure; II., the cost; III., the produce of turnips; IV., the gain in tons and cwts.

I.	II.	III.	IV.
0. 16 yards dung.....	£4 0s.	24 0	—
1. 4 cwt. White's manure	1 4	28 5	4 5
2. 2 cwt. guano, 2 cwt. salt.....	1 2,	28 15	4 15
3. 3 cwt. guano.....	1 10	27 2	3 2
4. 3 cwt. Baillie's bone manure.....	1 4	25 18	1 18
5. 3 cwt. coprolite.....	1 4	25 0	1 0
6. 3 cwt. London Manure Co's manure.....	1 4	27 14	3 14
7. 4 cwt. superphosphate.	1 4	26 7	2 7
8. 3 cwt. guano, 1 cwt. superphosphate, diluted with 200 gallons water.....	2 2	27 4	3 4
9. 3 cwt. superphosphate diluted with 200 gallons water.....	1 16	27 15	3 15

In the following table, column I. gives the number (referring to the preceding table) of the experiments; II., the quantity of water found in 10,000 parts of the turnip; III., the ash; IV., the protein com-

pounds; V., the fibre, sugar, &c.; and VI., the nitrogen found in these differently manured turnips. No analysis was made of Nos. 4 and 5, as the gain was not equal to the cost of the manures—

	I.	II.	III.	IV.	V.	VI.
0 . . . .	9327.0	39.6	83.8	549.6	13.2	
1 . . . .	9287.0	67.0	63.5	482.5	10.	
2 . . . .	9411.0	55.0	68.5	465.5	10.8	
3 . . . .	9345.0	58.0	82.5	514.5	13.1	
6 . . . .	9285.0	76.0	95.8	543.0	15.5	
7 . . . .	9243.0	59.0	73.0	625.0	11.	
8 . . . .	8862.0	75.0	117.4	945.0	18.5	
9 . . . .	9509.0	56.2	41.3	399.5	16.5	

As Professor Anderson remarks, these prove an interesting series of experiments with different varieties of manures—Nos. 4, 5, 8, and 9, do not pay the cost of application. Some of these, however,

yield a considerable profit, and that coupled, as in some cases, as in No. 6, with an improvement in the quality of the turnip, as indicated by the increased proportion of nitrogen, and diminished quantity of water. (Ibid. 225.)

It is hardly possible to overrate the importance of such researches as these. Long—long, I repeat may practice and science thus go hand in hand around the English farmer's fields; the good result of their union, let him be well assured, will not terminate in his time, or in that of his children's children. Fresh modes of cultivation, fresh fertilizers, will yet reward future enquirers after truth, and as the boundaries of knowledge increase, so, let the agriculturist be firmly assured, will be the produce of his fields.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A MONTHLY COUNCIL was held, at the Society's house in Hanover-square, on Wednesday, the 6th of April. The following members of Council and Governors of the Society were present:—Lord ASHBURTON, President, in the chair; Earl of March, Earl of Essex, Earl of Chichester, Lord Berners, Sir Robert Price, Bart., M.P., Mr. Alcock, M.P., Mr. Raymond Barker, Mr. Barnett, Mr. Beasley, Mr. Blanshard, Mr. Bramston, M.P., Mr. Brandreth, Mr. W. G. Cavendish, Colonel Challoner, Mr. Evelyn Denison, M.P., Mr. Druce, Mr. Gadesden, Mr. Garrett, Mr. Brandreth Gibbs, Mr. Grantham, Mr. Henry Hippisley, Mr. Fisher Hobbs, Mr. Holland, Mr. Hornsby, Mr. Chandos Wren Hoskyns, Mr. Hudson (Castleacre), Mr. Lawes, Mr. Lawrence, Mr. Miles (of Leigh Court), M.P., Mr. Millward, Mr. Mainwaring Paine, Mr. Pusey, Professor Sewell, Mr. Simpson, Mr. Thompson (Moat Hall), Mr. Turner (Barton), Captain Henry Vyner, Professor Way, Mr. Jonas Webb, and Mr. Woodward.

FINANCES.—Mr. Raymond Barker presented to the Council the monthly report of the Finance Committee, from which it appeared that the current cash-balance in the hands of the bankers, including the Gloucester and composition special balances, was 3,601l.

PRIZE ESSAYS.—Mr. Pusey, Chairman of the Journal Committee, reported to the Council the following awards made by the judges of essays and reports competing for the prizes offered by the Society:—

- I. To SYDNEY EVERSHED, of Albury, near Guildford, Surrey: the Prize of Twenty Sovereigns for his Essay on the improved method of cropping and cultivating Light Land, being the best Essay in the class of "Any other Agricultural Subject" for 1852.
- II. To JOHN B. SPEARING (Land-surveyor, Engineer, and Farmer), of Moulsoford, near Wallingford, Berkshire: the Prize of Thirty Sovereigns, for the best Essay on the relative advantages of Steam or other motive power applicable to Agricultural Purposes.
- III. To THOMAS ROWLANDSON, of Brompton, Middlesex:

the Prize of Fifty Sovereigns, for the best Report on the Farming of Herefordshire.

- IV. To HENRY EVERSHED, of Albury, near Guildford, Surrey: the Prize of Fifty Sovereigns, for the best Report on the Farming of Surrey.
- V. To JOHN JEPHSON ROWLEY (Land Agent, and Valuer of Land and Tillages), of Rowthorne, near Chesterfield, Derbyshire: the Prize of Fifty Sovereigns, for the best Report on the farming of Derbyshire.
- VI. To FINLAY DUN, jun. (Lecturer on Materia Medica in the Edinburgh Veterinary College), of 41, Heriot Row, Edinburgh: the Prize of Twenty Sovereigns, for the best Account of those Diseases in the Sheep and the Pig, which either are or may become hereditary.
- VII. To the Rev. THOMAS BURROUGHES, of Gazeley, near Newmarket: the Prize of Twenty Sovereigns, for his Essay on the Bean Turnip Fallow, as the best Essay in the class of "Any other Agricultural Subject" for 1853.

COMMENDATIONS.—Farming of Derbyshire; motto, "Adscriptus glebae." Management of Sheep during Lambing; motto, "Health with Profit." Any Agricultural Subject, 1852; motto, "Beta."

CHEMICAL INVESTIGATIONS AND LECTURES.—Mr. Pusey, as Chairman of the Chemical Committee, then laid before the Council the following report from Prof. Way, the consulting chemist to the Society:—

I beg to make my usual report to you, of the operations which have been carried on in the laboratory during the past 12 months. The number of analyses made for members of the Society at the reduced fees, from the 1st of April, 1852, to the same date in the present year, is 179. They may be classified as follows:—

Limestones and marls . . . . .	5
Soils . . . . .	24
Guanos . . . . .	78
Superphosphate of lime . . . . .	23
Various artificial manures . . . . .	15
Coprolites, bones, and other phosphoric substances . . . . .	11
Oil cakes . . . . .	5
Waters . . . . .	4
Miscellaneous substances . . . . .	14

179

The number of analyses of guano made this year is more than double that of the preceding year. The samples o

superphosphate are much the same in number as last year, but it is worthy of mention that their *quality* is continually improving—a circumstance which is undoubtedly due to the increased intelligence of the manufacturers of artificial manures, and the eagerness with which they now avail themselves of the aid of experienced chemists. In affording every advice and assistance in my power to manure-makers, who are desirous of producing good manures, I believe that I am indirectly but materially promoting the objects of the Society, and the interests of the agricultural community. Since the last annual report a second paper “On the Absorptive Power of Soils” has been published in the Journal of the Society. The object of this paper was to explain the *cause* of the phenomena which had previously been brought under notice in relation to this question, and nothing has since occurred to shake my confidence in the correctness of the explanation then given. During the last year I have made a good many experiments in relation to the action of lime on soils, and more especially in reference to the power of acquiring increased fertility by cultivation, and benefiting, in a higher degree, from the application of manure, which, I believe, lime imparts to soils. These experiments, which also involve the question of the absorption of ammonia from the air by soils, are most interesting, and likely to suggest many practical improvements. They are not yet, however, in a state sufficiently advanced for publication, and with the sanction of the Committee I purpose to continue the investigation during the coming year. The Committee are aware that at a late meeting of the Society an account was given by me of the discovery which, in conjunction with Mr. Paine, I had lately made, of a large and apparently inexhaustible supply of soluble silica in the lower beds of the chalk formation in Surrey. The examination of the different strata containing this mineral has occupied very much time and attention; and although, in the nature of things, such a discovery, as it was not anticipated, could not have been recommended by the Committee as a subject of investigation, I feel sure that its prosecution will receive the full sanction; and I may be allowed to point to it as a striking instance of the policy of the course which the Committee has adopted, of allowing to the chemists of the Society a discretionary power in following out those subjects which may from time to time present themselves as well worthy of attention. It is hoped that this source of available silica will ultimately prove the means of accomplishing the production of the double silicates for agricultural use; and it has already been made to combine with lime so readily and inexpensively as to produce an exceedingly cheap compound. It must be left to experience to decide whether the silicate of lime so formed will be of any value in practical agriculture; but should it be found, as there is great reason to hope it may, that the compound, when applied to light land, possesses the property of strengthening the straw of wheat, and of rendering the use of guano and other powerful manures more admissible and less uncertain for this crop, a most important step in the right direction will have been made, and the ultimate results of the discovery in question can hardly be foreseen. I have been requested by the Chairman of the Journal Committee to prepare for publication a detailed account of this investigation, which will consequently appear in the forthcoming number of the Society's Journal. The Committee will see that, although much has already been accomplished, much still remains to be done in working out the connections of these interesting subjects; and inasmuch as the chemistry of soils with which they are all

intimately connected is at once both the most important and the most obscure of all the questions requiring investigation, I do not hesitate to recommend that they should be carried forward till nothing remains to be learnt concerning them. At the same time I would suggest that as the *examination of the waters of agricultural drainage* is likely to throw light on these questions, it should be added to the list of subjects recommended for investigation. I shall be happy to give two more lectures before the members of the Society in the present season, and the subjects which occur to me as likely to be interesting and useful are—1st, The different methods proposed or available for saving the sewerage and other excrementitious matter of towns for agricultural use; 2nd, The comparative nutritive value of the natural and artificial grasses.

The Council adopted this report, and arranged that Professor Way's first lecture should be delivered to the Governors and Members in the Council-Room of the Society, on Wednesday, the 11th of May next; and the second lecture on Wednesday, the 15th of June; to commence in each case at the usual hour of 12.

**CERTIFICATES OF ENTRY.**—Mr. Milward, Chairman of the Certificate Committee, submitted to the Council the new forms of entry for live stock at the country meetings of the Society; which were approved and adopted by the Council.

**PONIES.**—Mr. Fisher Hobbs having called the attention of the Council to the size of ponies qualified to compete for the Society's prizes at the Gloucester meeting; it was carried on the motion of Mr. Lawrence, that such ponies should not exceed the height of 13½ hands.

**GLOUCESTER MEETING.**—Mr. Raymond Barker, Vice-Chairman of the General Gloucester Committee, reported to the Council the following statement of the proceedings of the Committee, in connexion with the preparations for the Society's ensuing country meeting, to be held at Gloucester, in the middle of July next.

1. That the extent of ground originally assigned for the show-yard be increased by the addition of three adjoining acres, and that the expense of levelling and draining such extra ground be borne by the Society.

2. That the attention of the Local Committee be called to the importance of making such arrangements, on the part of the authorities of Gloucester, in reference to tolls of every kind, that would otherwise be levied on exhibitors proceeding to the show-ground, as may lead to a satisfactory result at the time of the meeting.

3. That the question of accepting the offer of a supply of steam generated at works nearly adjoining the show-ground, and easily to be conveyed into the trial yard, be referred to the Implement Committee of the Society.

4. That the contractor's offer for the supply of hurdles be accepted.

5. That Mr. Druce, of Eynsham, be requested to favour the Society by undertaking to value between the Society and Mr. Jones, as to the price to be paid for Wheat, Vetches, Clover, Hay, Straw, and other supplies required in the cattle and implement yards.

6. That Mr. Holland's liberal offer of £50, for the institution of prizes at the Gloucester meeting for Vale sheep, be

respectfully declined, in consequence of the committee's not being able to make such an arrangement of the proposed prizes, consistently with the Society's prize-sheet, as would fully meet Mr. Holland's object in desiring to institute such a class of prizes.

7. That the Secretary be directed to make the usual application to the various railway companies throughout the kingdom, in favour of the Society's exhibitors proceeding with their implements and live stock to and from the Gloucester meeting.

8. That the pavilion for the great dinner of the Society be erected in the Spa Gardens.

This report was adopted by the Council; and Mr. Druce, as one of their members, expressed the pleasure it would give him to act as the valuing referee between the Society and Mr. Jones, as proposed by the Committee.

**SECRETARY.**—On the motion of Mr. Pusey, seconded by Mr. Fisher Hobbs, and supported by Mr. Thompson, Colonel Challoner, and Lord Chichester, the following resolution was passed by the Council unanimously:—“That on account of the Secretary's long, faithful, and efficient services, his salary be raised by £100 a year: and that the first payment of the increased salary commence in May next.”

The President having informed the Secretary, on his return to the Council Room, of the great pleasure it gave him to communicate to him this unanimous resolution, the Secretary expressed to his lordship and the Council his deep and grateful sense of this most gratifying mark of their kindness and generous consideration towards him.

**AGRICULTURAL STATISTICS.**—The President informed the Council, that having been summoned by that department of her Majesty's Government forming the Board of Trade, to an interview on the subject of Agricultural Statistics, he had thought it to be his official duty as President, accompanied by the Secretary of the Society, who had been also summoned, to attend such interview accordingly, for the purpose simply of receiving from the Board of Trade, and communicating to the Council, any request made to him on that important subject, leaving it to the Council to decide, whether the Society as a body, or only its members in their individual capacity, could consistently with its constitution take any distinct measures in promoting the collection of such statistical information.

The Council agreed that as such measures were not simply connected with the improvement of practical agriculture, but had a direct bearing on prospective legislation in Parliament, the Society could not by the following stringent condition of its charter entertain their discussion or promotion:

“And know ye further, that in granting this our Royal Charter to the said Royal Agricultural Society of England, we do hereby declare it to be our full and entire will and pleasure that we extend our Royal protection to its national objects, under the condition that a principle of its constitution shall be the total exclusion of all questions at its meetings, or in its proceedings, of a political tendency, or having reference to measures pending, or to

be brought forward, in either of our Houses of Parliament; which no resolution, bye-law, or other enactment of the said body politic and corporate, shall on any account or pretence whatever be at any time allowed to intringe.”

**COUNTRY MEETING OF 1854.**—The Town Clerk of Lincoln attended the Council on the part of the Mayor and Corporation of that city, with a memorial and other documents connected with the Country Meeting of the Society to be held in 1854, at some place within the district comprised of the counties of Leicester, Lincoln, Nottingham, and Rutland.

The Earl of Yarborough transmitted a memorial on the part of the Lincolnshire Agricultural Society, of which his lordship is the President, in favour of the city of Lincoln as the place of such meeting.

These documents were referred to an Inspection Committee, consisting of Mr. Raymond Barker, Mr. Fisher Hobbs, Mr. Brandreth Gibbs, and Mr. Milward, with a request that they would pay a personal visit to the localities proposed, and report at the next Monthly Council on their capabilities for the purposes of the Society.

**OFFER OF PRIZES.**—On the motion of Mr. Fisher Hobbs, seconded by Mr. Pusey, the Council resolved: That in future no private offer of a prize for the Country Meeting of any year shall be taken into consideration by the Council, after the first Wednesday in the month of February of such year of meeting.

**GUANO.**—The Duke of Richmond favoured the Council by transmitting to them a communication addressed to his Grace by the Duke of Newcastle, H.M. Principal Secretary of State for the Colonies, enclosing letters from his Excellency Sir Henry Young, Lieutenant-Governor of South Australia, and Mr. Herschel Babbage, mineral and geological surveyor to the Crown in that dependency, on the subject of a research for guano and other manuring substances, undertaken by the late Government at the request of the Duke of Richmond, and in consequence of which circular letters were transmitted last year from the Foreign, Colonial, and Admiralty Departments, urging their respective officers in every part of the globe to exert themselves in the discovery of valuable manures. These communications were the first return to such circular inquiry.

On the motion of Mr. Brandreth Gibbs, the best thanks of the Council were voted to the Duke of Richmond for the favour of these communications, which were referred by the Council to the Guano and Chemical Committees of the Society.

**GEOLOGICAL MAPPING.**—Mr. Trimmer having completed his geological map, on a large scale, of the estate of Sir Charles Elton, Bart., in Somersetshire, had the leave of the Council to submit it to the inspection of the Council, and explain its construction and advantages in an agricultural and mineral point of view, on Wednesday, the 20th of April, at 12 o'clock.

The Council then adjourned to their weekly meeting on Wednesday, the 13th of April, when Prof. Wilson would deliver a lecture on Flax.

A Weekly Council was held at the Society's House, on Wednesday, the 13th of April. Present: Lord Ashburton, President, in the chair; Earl of Essex, Earl of Lucan, Lord Berners, Hon. R. H. Clive, M.P.; Sir Robert Price, Bart., M.P.; Mr. B. Almack, Mr. Bethell, Mr. Bullen, Colonel Challoner, Mr. James Chapman, Mr. E. Davy, Mr. Festing, Mr. Foley, M.P.; Mr. Freeland, Mr. Frere, Mr. Gadesden, Mr. Brandreth Gibbs, Rev. L. Vernon Harcourt, Mr. Fisher Hobbs, Mr. Holland, Mr. Kirkwood (Flax-Commissioner from Canada), Mr. Paine, Mr. Risler (of Versailles), Mr. Rowlandson, Prof. Sewell, Mr. Slaney, Mr. Smith (St. Albans), Dr. Somerset, Mr. Spencer Stanhope, Mr. Crompton Stansfield, and Prof. Way.

#### LECTURE ON FLAX.

Professor John Wilson (late Principal of the Royal Agricultural College, Cirencester) delivered a lecture on the treatment and application, agricultural and technical, of Flax.

He gave an interesting statement of the botanical character and geographical distribution of the Flax plant, and of references made to it and its manufacture into cloth by sacred and profane writers from the earliest period, particularly citing the opinion of Virgil, on its cultivation, and the details given by Pliny of the Flax-fibre imported into Italy from Egypt. Prof. Wilson then stated the successive measures adopted, from the year 1172 to the middle of the last century, for compelling farmers to cultivate Flax, and public rewards since held out for inducing attention to the perfection of its manufacture. He proceeded to enumerate the various soils and the general conditions of the rotations connected with Flax cultivation, and especially to dwell on the necessity of deep cultivation, fine tilth of surface, and ready supply of manuring matter for the plant. He considered sandy loams and alluvial soils the best for amount of crop and fineness of fibre, and the crop best grown after Grass, Corn, root-crops. He entered into a full statement of the constitution of the flax-straw, and its treatment by the dry mechanical or the moist chemical process. He enumerated the various attempts at mechanical separation of the fibre, from 1812 to the present time, and the peculiarities of the several plans adopted at various times in this country and the continent for removing the glutinous matter by means of fermentation, chemical solution, and the application of hot water or steam, without fermentation. He stated the decided advantages possessed by the latter new modes over the old systems, not only in saving of expense in time and labour, but in the removal of the glutinous matter in an innocuous form adapted at once to be mixed with the woody matter, and used as food for cattle. He concluded his lecture by describing in detail the plan of Watts, by means of which steam was passed upwards, in its state of vapour, through a mass of flax-straw, and, being cooled by a refrigerator, forming the top of the vessel, was sent downwards back

again through the straw, carrying with it, in solution, the glutinous matter from the fibre; and the improvement made on this plan by Buchanan, who, by means of alternate pressure and condensation of steam, forced forwards and backwards through the mass of flax-straw successive bodies of warm water, at such a temperature as not to coagulate the vegetable albumen contained in the plant. The action of this last process was shown successfully by an elegant experiment in glass vessels, which, as the spirit-lamp was applied or withdrawn, continued its automatic process of the propulsion and retraction of fluid through the straw during the continuance of the lecture. Professor Wilson exhibited to members various samples of flax-straw in its original state, and prepared by the above processes for scutching, as well as of manufactured articles in various stages of preparation. He also submitted to the members striking diagrams of the machinery referred to, and tabular statements of the analysis and value of different parts of the plant and of the glutinous liquor obtained from the straw, and beautiful coloured drawings, of natural size, of the varieties of flax, and different portions of the plant. He also entered into details connected with the commercial value of Buchanan's system, and with its adoption with advantage in farming districts.

On the motion of Mr. Slaney, seconded by Mr. Fisher Hobbs, the best thanks of the meeting were offered to Prof. Wilson for the very interesting lecture he had delivered to the members on that occasion.—This was the first lecture on Flax Mr. Hobbs had heard that would induce him to grow that crop; for he could understand that with a boiler and a few other vessels, any farmer, by the means proposed, might economically reduce his Flax-straw into a state ready for scutching by the manufacturer.—Mr. Stansfield had grown Flax, but could not obtain a remunerative price for the straw.—Mr. Davy feared the machinery proposed would not prove so economical as that by which the mechanical process was carried out. He exhibited some fine samples of Flax produced without any application of moisture. He thought the oil ought not to be carried off from the straw, but to remain in it, and confer that soft flexibility which those samples had in which such oleaginous matter was left.—Mr. Slaney thought the cost to farmers would be high.—Mr. Bullen thought the proposed plan peculiarly applicable to ordinary machinery, to the steam apparatus in ordinary use in large and well-appointed farms: if so, this plan would prove a great boon to the producer of the raw material, whose great object was to be able to render the Flax as portable as possible. Transport of it was, to him, a vital question.—Professor Wilson stated that a machine of this kind, erected at an expense of £500, would turn out three tons of Flax-straw a day ready for the scutcher; and that a machine at £250, one ton a day. These machines were too powerful for individual farmers, and were intended for given districts of certain circuit extent, under which circumstances the price of machinery

would sink into an average item of comparative insignificance.

Professor Wilson was requested by the Journal Committee of the Society to prepare, by the 1st of May next, a complete detail of this lecture for the pages of the Journal; in order that the information then furnished by him to the Society might, with as little delay as possible, be given in a complete state to the members at large of the Society, through that medium.

The Council then adjourned to their weekly meeting on Wednesday, the 20th of April, when a Report would be read on the progress of the Claussen process of treating Flax-fibre, and an explanation given by Mr. Trimmer of his recent geological and mineral survey of the estate of Sir Charles Elton, Bart., in Somersetshire.

A WEEKLY COUNCIL was held at the Society's house, in Hanover-square, on Wednesday, the 20th of April: present, Lord ASHBURTON, President, in the Chair, Hon. R. H. Clive, M.P., Right Hon. James Grattan, Mr. Amos, Mr. Raymond Barker, Mr. Burton, jun., Rev. Thomas Cator, Colonel Challoner, Mr. J. C. Clark, Mr. Capel Cure, Mr. Dyer, Mr. Gadesden, Mr. Garrett, Mr. Brandreth Gibbs, Colonel Hall, M.P., Mr. Fisher Hobbs, Mr. Hornsby, Mr. Jones, Mr. W. Long, Mr. Majendie, Mr. Manning, Mr. A. Murray, Mr. Nesbit, Mr. Mainwaring Paine, Mr. Pocock, Professor Sewell, Mr. Slaney, Mr. Reynolds Solly, Mr. Spencer Stanhope, Mr. Thompson (Moat Hall), Mr. Hampden Turner, Captain Henry Vyner, Mr. Wade, and Professor Way.

MAPS OF ESTATES.—Mr. Trimmer, of Wilmington, near Dartford, submitted to the inspection of the Council the two maps on a large scale he had recently completed, of a portion of the estate of Sir Charles Elton, Bart., in Somersetshire, agreeably with an offer he made in his lecture delivered before the Society last year on "Agricultural Geology," to undertake gratuitously the construction of such a survey, in order that his views on the connexion between agriculture and geology, in its practical bearings, might be more distinctly understood by the members. He preceded his explanation of these maps by a statement of the progress of his operations, in endeavouring to impress upon the agricultural community the importance of this connexion, and in carrying out practically his views on this subject. He gave a sketch of the history of geological mapping, and defined the different objects respectively, of the general geologist, and the mineralogist, and the farmer, with which maps of any area of country would be consulted for their practical guidance. The two maps of about 300 acres of the unleased portion of Sir Charles Elton's estate near Clevedon, prepared by Mr. Trimmer, and then submitted by him to the members in juxtaposition with the Ordnance survey, were of two characters: the first, which Mr. Trimmer compared to the bony skeleton of a given district, represented the denuded

geological formations, as in ordinary geological maps; the second, which Mr. Trimmer compared to a skeleton clothed with muscle and integument, represented the actual surface-soils and subsoils of such district, without reference to the great geological masses of rock on which they rested. He entered into a minute detail of the mode in which the various formations or soils were distinguished by him by particular colours and marks on the maps in question, and of the very simple means and cheap rate of producing similar maps of any district throughout the country. He also pointed out the various advantages which such a survey would possess in determining the best mode of obtaining a supply of water at any given point, and ascertaining the relative value of different series of rocks for road, lime, and cement making, and for building and other purposes. He hoped that the land-surveyors would at once apply themselves to a study of surface-geology; an inquiry new in its origin, and which he had himself had the pleasure of first developing in his prize essay in the 12th volume of the Society's Journal.—Mr. Wm. Long stated, that for several years he resided in that part of the country, and had many opportunities of observing its geological features. He admitted that the proposed plan of mapping estates was a move in the right direction; at the same time, that whilst considerable difficulties would often occur in other districts, that delineated by the maps produced was one of such striking and remarkable geological character, that the peculiar features of it were easily described. It was also a line of country so rich and fertile, that the occupants of the soil rarely followed any particular course of cultivation, but crop after crop followed in succession, and they trusted more to the excellence of the soil than the experience of agriculture. An experiment had been made on the Wroxall hills, immediately adjoining the property described by his friend, Mr. Thomas Kington, some few years since, under the able superintendence of Mr. Webb Hall, and having adopted the improved course of cultivation, admirable results followed; and it therefore went to prove that if on inferior lands in that district ample returns were produced, how much greater would be the benefit to those occupying the richer soils in the valleys, if by a knowledge of an improved system of science adapted to agriculture, by the scheme of mapping now suggested, the varied phenomena of geographical features were illustrated!—Mr. Hampden Turner favoured the Council with remarks on the extent to which such mapping had been carried by Mr. Trimmer; Mr. Raymond Barker, on the importance of ascertaining, before erecting buildings, the possibility of obtaining a due supply of water at a moderate rate; and Mr. Slaney, on the great interest and importance of such surveys as those now submitted by Mr. Trimmer, to all owners of land, especially, as had been remarked, in guiding their operations in search of water, and in directing their cuts in drainage. He had himself suffered great loss, and a friend of his a still greater one, in attempting to sink wells to a great depth

in order to obtain a supply of water, all of which would have been prevented had they been in possession of such structural knowledge of their estates as those data furnished by Mr. Trimmer would have supplied, and at so economical a rate of charge as about a shilling an acre. The best thanks of the Council were then voted to Mr. Trimmer for the kind trouble he had taken in introducing to the inspection of the Members those interesting surveys, on the motion of Mr. Raymond Barker, seconded by Mr. Gadesden; who remarked, that he trusted all proprietors of estates would give effect to this important object, and place themselves at once in possession of the quantities and qualities of the various soils of which their property consists.

Communications were read from Mr. M'Dermott, giving an account of the successful progress made, both in this country and on the continent, in the establishment of Flax works on the Chevalier Clausen's principle; from Mr. Rodwell, of Alderton Hall, inclosing a letter from his bailiff on the result of his experience in feeding stock with hay in its chopped and whole state; from Mr. Hunt, of Vine Farm, Basingstoke, on the trial of ploughs: for all which the usual acknowledgments were ordered.

The Council adjourned to Wednesday, the 27th of April, when Mr. Slaney will give a statement of his experience on the construction of wells and pumps for the use of cottagers.

#### NEW MEMBERS.

The following new members were elected:—

Bayly, William, Bretwell, Burnham, Bucks  
 Bean, Joseph, jun., Spittle, Kendal, Westmoreland  
 Bell, Captain Henry, Chalfont Lodge, Cheltenham  
 Birkin, Richard, Apsley House, Nottingham  
 Blunt, Francis C., Tooting, Surrey  
 Blyth, John, Stanford-le-hope, Essex  
 Budd, J. Palmer, Y-sta-la-fera, Swansea  
 Chadwick, E., Grimston Park, Tadcaster, Yorkshire  
 Chandler, Thomas, Haresfield, Gloucester  
 Cobley, Walter, Wootton-under-Edge, Gloucestershire  
 Coldicote, William, Over-Norton, Oxfordshire  
 Corfield, C. L., Windlesham Hall, Bagshot, Surrey  
 Davies, William Keville, Croft Castle, Leominster  
 De Porquet, L. F., Fairkyte, Hornchurch, Essex  
 Downs, Henry, Manor House, Basingstoke, Hants  
 Drinkrow, John Wm., Tipthorpe House, Driffield, Yorkshire  
 Edwards, P. N., Brinsop Court, Hereford  
 Eyres, Capt. Harry, R.A., C.B., Knockwood Park, Tenterden  
 Farnworth, John Kay, Alderley Edge, Wilmslow, Cheshire  
 Gillett, John, Minster-Lovel, Witney, Oxon  
 Griffin, Edward, Wolverhampton, Staffordshire  
 Gwyn, Wm. Edward, Pilsforth, Carmarthen  
 Hall, John, Bretforton, Evesham, Worcestershire  
 Halsey, Thomas, Whitminster, Gloucester  
 Herbert, Rev. John, Leigh Parsonage, Reigate, Surrey  
 Hussey, Phineas Powke, Wyrley Grove, Walsall, Staffordshire  
 Leeming, Dan, Little Blackwood House, Halifax.

Myddelton, Robert, Gwanynog, Deubigh  
 Napier, Hon. William, 1, Lower Belgrave Street  
 Parsons, Henry, Haulbury, Crewkerne, Somersetshire  
 Randolph, Captain Charles Wilson, Grenadier Guards  
 Rea, Edward, 115, Wardour Street, Soho  
 Rowland, Johu, Neath, Glamorganshire  
 Ruddingham, John, Guiting Graze, Stow, Gloucestershire  
 Sessions, Jesse, Norfolk House, Spa, Gloucester  
 Smith, John, Parton Court, Churchdown, Gloucester  
 Thyne, Fred. George, Pleaford Lodge, Guildford, Surrey  
 Vevers, John Brace, York Hill Court, Ledbury, Herefordshire  
 Williams, Geo. Griffiths, Cwmcynglin, Aberystwith, Cardigan  
 Wilson, John, Pershore, Worcestershire.

#### WATER-DRILLING.

This subject, or one closely connected with it, has recently, on two occasions, been particularly dwelt upon in the *Mark Lane Express*. It is quite correct, as stated in the important article that appears in the paper of Monday, the 18th inst., that the authority of that able and zealous patron of agriculture, Mr. Pusey, is fully sufficient of itself to stamp importance upon any practical subject on the broad scale. But there are many minor circumstances which, though they exist only in the garden, may be adduced as irrefragable evidences in favour of a principle sound and trustworthy in itself. It is well known to gardeners that there are certain seasons of limited extent, when vegetable seeds require to be sown; such are particularly the broad-leaved or prickly spinach, winter coleworts, and spring cabbage. The season for the first and last of these occurs in August, almost to a week. Now (as in 1847) the weather then is often dry, even to parching. I have frequently urged a practice, which I again earnestly recommend, and that is, the sites being arranged, to thoroughly wet and soak with a fine rose pot the entire space to be seeded; to do this before sunset, and cover with mats all night and the following day till late in the afternoon, then to repeat the watering and covering, and so on for three successive days; on the fourth, to draw the drills, watering along the course of each, and immediately to sow the seeds, and cover with fine screened earth. This preparation and care will effectually secure the germination of every good seed. The processes are much to be preferred to any artificial soaking of the seed itself; and as to the attempt to raise seeds in dry ground during parching summers, trusting to superficial watering, it is perfectly futile. On some occasions, where liquid phosphate of lime is required, and occasionally guano, the drills may be so moistened; but the strength should be much reduced by soft pond or river water.

Croydon.

J. TOWERS.



## A FEW SUGGESTIONS FOR THE MONTH OF MAY.

## GRAZING.

As this is the principal month for stocking pastures, I offer two or three remarks. Be cautious to stock according to the quality of your land; do not put young stock upon good land or upon luxuriant pasturage. You must use the same precaution relative to all kinds of stock in a low state or lean condition. Good land, to be profitably grazed, must be supplied with good stock, or, at least, stock in good health and fair condition; otherwise you must assuredly expect loss from scouring, indigestion, or becoming hoven. Lean stock should be put upon land of inferior quality; and as they improve in condition they may be removed to better pasturage, and so continued progressively.

*Sheep Lands.*—To graze sheep lands profitably they should be stocked in proportion of one young steer or heifer to twelve sheep; these will keep the pasture or grass young, and the steers will prevent roughness in the pasturage. I consider three ewes with their lambs equal to five sheep, and also three cows or heifers suckling their calves about an equivalent to five young steers. Sheep pastures should be kept well eaten down, but not too bare. Sheep delight in frequent feedings, and will generally choose a sweet level spot where the grass is young. An old grazing rule is, "Have your pasture twelve days' old for your ox, and twenty-four hours' for your sheep."

*Sheep.*—By all means suit your sheep to your pasture, and to the locality and climate. Mountain sheep to mountain pastures; lowland sheep to lowland pastures. This is a general rule. The varieties of sheep are so numerous I can scarcely touch upon that subject here, but I would say that, as railways have offered such ready access to distant districts, the grazier is unpardonable who does not look out for the very best and most suitable in each variety. South Lincolnshire graziers, in dear seasons, will sometimes go up to Westmoreland for sheep to graze in their admirable pastures. This is not in good judgment, but it shows what may be done through railway communication. Experience teaches wisdom on these points, as well as others. The Lincolnshire graziers have for several years gradually increased their number of half-bred sheep, which have of course so far displaced Long-wools and Leicesters. The Half-bred in general favour is a cross from the Leicester or Long-wool ram and the Down ewe. They are quick feeders, and come to early

maturity, mostly being fed off in eighteen months, yielding about six pounds of wool and from 80 to 90 lbs. of mutton, of a quality nearly equal to the best Southdown. Besides this, lands of first quality will fatten one per acre more of the Half-bred sheep than of heavy Long-wools; and nearly in the same proportion do they excel the large Leicesters. My own prepossession is in favour of the best breeds of Long-wool sheep for good lowland pastures; they produce in eighteen months about 10 lbs. of wool and 100 to 110 lbs. of mutton, nearly equal in quality to the Half-bred, and more saleable, as being more in accordance with the requirements of the labouring population; and the wool has latterly realized nearly the same price, and from corresponding causes. The Cotswolds I cannot believe well qualified for the bleak highland pastures where they are chiefly found; they may do well in the marshes of Somersetshire, but the Cotswold Hills would be more profitably grazed with smaller sheep. A stranger, in passing over these hills, cannot fail to be struck with the paucity in the numbers of sheep which he sees grazing in the fields; finer animals he cannot behold, but they look more like stragglers than flocks actually grazing. I should much prefer Southdowns, Hampshire Downs, or the Half-breds; nor should I be very fastidious as to the precise cross: first-rate animals are produced from the Cotswold ram and the Down ewes: but to persist in grazing these immense sheep on such poor pasturage, and at such an elevation, does appear to me decidedly wrong: it is not suiting the animal to the pasture. The pure Southdown sheep appears to be in great favour in the eastern, south-eastern, and southern parts of the kingdom: they are unquestionably a most valuable breed of sheep, and admirably adapted for elevated downs and for folding purposes. They travel with such facility that every nook and corner in their pasture is speedily searched in quest of food; they (as a herd) are in this particular at a fault. They are more restless than the larger breeds of sheep, and their habit is to herd more together; this is injurious to the pasturage, and prevents their rapid fattening: a mild, docile animal will acquire fat much faster than the wilder or more timid one. The Leicester sheep, in this respect, excels the Southdown; he is in general a lazy, docile creature, and his business appears to be to accumulate fat, which he does more quickly accom-

plish to a greater extent than almost any other breed. But it is fat. I like a fair proportion of lean flesh, and in this particular the best Long-wools excel the Leicesters; and as they will produce more wool and a greater weight of mutton from the same extent of pasturage, they are to be preferred. The Leicester breed of sheep partakes of a large degree of favour amongst the midland counties' graziers, and they are exceedingly well adapted to their sweet and beautiful pastures. The small breed of Leicesters is mostly grazed in these counties; and as they "go off" quickly, the lands are soon ready to take in the breeding stock from the grass seeds. I think in public favour this kind or variety—"the small Leicester"—stands as high as any; but the gradation is such that

it is a difficult case to adjudge where the small Leicester breed stops, and the large Leicester begins. For the smaller variety I should go into Bedfordshire, Northamptonshire, and adjoining counties; for the larger variety I should visit Rutlandshire, North Lincolnshire, and East Yorkshire.

I have noticed some of the best breeds of sheep for fattening. For breeding purposes others might be advantageously included. The Dorsets stand first for early lambs; the Exmoors are good breeders, and will live anywhere; the old Norfolks are good sucklers, but are now seldom seen; the Romney Marsh sheep, or Kents, are good breeders and hardy, but possess ill-formed frames, and are slow feeders.

P. F.

## THE PROSPECTS OF AGRICULTURE, AS POURTRAYED IN A JOURNEY OF ONE THOUSAND MILES THROUGH THE PROVINCES.

(BY OUR OWN CORRESPONDENT.)

A railway journey of a thousand miles through the provinces must always prove to the farmer a source of valuable information at any season of the year, more especially in seed-time or harvest. No doubt the time allowed for the examination of individual fields and farms is short; yet to the traveller of long experience, and previously acquainted with the soil and agriculture of the various districts through which he is passing, general conclusions may be arrived at, by no means unsatisfactory. True it is that there are many exceptionable cases, where second questions arise—questions which would require a return to the field before a satisfactory solution could be arrived at; while in exceptionable seasons like the present, cases of this kind multiply, and equally true it is that no such return can be made: still such is the activity of the mind, that judgment on passing scenes is generally awarded with a greater velocity than that with which the engine sweeps along the "iron-way" with its devoted train, so that when these exceptionable cases burst upon the eye, eagerly catching them in advance and following them until they are lost in the distance behind, many more questions are started and answered than could well be imagined by parties unacquainted with circumstances of the kind. It is singular with what rapidity previous crops and management observed on former occasions, together with the present state of things, are disposed of by the mind, so as to account satisfactorily for circumstances not in keeping with those around them. Indeed, exceptions of this kind only tend to make the journey more interesting to the agriculturist than it otherwise would be. Returned from such a journey, a cursory glance at the contents of our note-book may not be without interest to our readers generally.

As to dates and distances, we left the metropolis on the evening of the 9th instant per mail-train from

Euston Station for Edinburgh; from Edinburgh, per Scottish Central, for Montrose on the 11th; from this latter place we made an inland tour of some twenty miles, *via* Brechin and Fearn, on the 12th; on the 13th arrived at Aberdeen; from whence we also took an inland tour per coach, returning the following day to Montrose and succeeding one to Edinburgh, where we remained over Saturday and Sunday, leaving for Berwick on Monday evening, the 18th instant; on Tuesday we got to Newcastle; and on the following day returned home. We were thus absent from the evening of the 9th to the evening of the 20th, an interval during which vegetation has made considerable progress in the Surrey suburbs of the metropolis where we reside, and hence has no doubt made similar advances in the districts through which we have passed, unless where checked by counteracting causes—circumstances which must be borne in mind subsequently, in the perusal of our peregrinations; and the whole distance travelled, it will be also perceived, amounts to nearly 1,200 miles, about 200 of which were gone over under night—or from Surrey to near Preston—leaving nearly 1,000 miles under daylight through the different provinces in the above route, subject to observation.

Throughout the whole of the above journey we have much pleasure in premising that our report of the crops and general prospects of the country is favourable generally speaking, much more so than we expected it would have been under existing circumstances: for we travelled the same road in January, and from the state we then found the country in, did not expect that vegetation could have made the same progress, or that the lands—many of them then several feet under water, others washed away as it were, or covered with drifted material, while the general breadth of them was so battered and consolidated as to exclude the cheering warmth of th

sun and influence of the atmosphere—could have so far recovered as to render them now subject to the plough, clodcrusher, and harrow. There were very few soils indeed sufficiently drained to carry off the whole of the heavy rains which fell during the past season. We have often had occasion to notice the impropriety of placing drains at great distances asunder, because of their greater depth; and the past season has more than confirmed our previous experience. Drainage is certainly the grand improvement of the age, but it is one nevertheless but very indifferently understood, from the fact of parties being led astray by an empty-pocket-view of the subject, so to speak. What the country obviously wants at present is a statistical view of the increase of produce arising from drainage and all our other agricultural improvements; for whenever any approximation has been made to science in the carrying out of those improvements, such as drainage, crops of every kind not only look well, but promising in a flattering degree; so that when the contrary is experienced it has to be attributed to the slovenly state of practice and the want of agricultural progress. Vegetation has no doubt been slow since the severe frosts of March gave way, but it is more sure on that account, being less liable to be affected by the sudden transitions of temperature to which it is always subject at this season of the year; while, on the other hand, many wet soils have not dried so fast as the impatience of many farmers has loudly demanded; but we question very much if such farmers have lost anything by the slow drying of their wet, adhesive soils. We rather apprehend that had they experienced the contrary, *a severe drought*, the present season is just what they would have demanded; so that taking an impartial view of circumstances as they really exist, all parties have good reason to be thankful for the propitiousness of the present month, and its adaptation to the peculiar wants of the season. Looking back on the many fields which we have so lately passed, we can point out many instances where the rain, which is falling freely to-day (22nd), will do harm; but such cases are exceptions from the general rule; for in the vast majority it will do good, not only to vegetation, but also to fallow-lands, by rendering them more easily pulverized for green-crops. Indeed, without such an auxiliary, it would be difficult to conceive the possibility of growing green-crops on many soils. No doubt, where improper drainage, or no drainage at all, exists, an excess of rain at the present season would soon do harm; but where efficient drainage exists, there is little danger to be apprehended.

From Preston to Lancashire grass appears more than willing to grow, and vegetation of every kind to advance on all lands comparatively dry. Wheat looks much better than could be expected in this climate, even on soils the reverse of dry. Spring sowing has only commenced on the drier description of soils; while the opposite are too wet to carry the teams. There is a vast extent of wet grass lands in this province producing little but rushes and other aquatic plants, especially after getting to Garstang, and lands burdened with an useless

amount of antiquated fences. Where these have been removed, as they have been about some gentlemen's seats, and the lands otherwise improved, how green, fresh, and promising the landscape appears!—presenting a singular contrast with those under the old style management in question. Ewes and their followers rather looking poorly. Efficient drainage, deep cultivation with plenty of guano and bone-dust, are capable of effecting an entire revolution for the better in the husbandry of this district. From Lancashire to Kendal things are in a similar state; and from Kendal to Penrith, ditto, with but a few exceptions, occasioned by diversity of soil, elevation, and management. About Penrith things look extremely well, taking every thing into account, and bid fair for an abundant harvest along both banks of the river onwards to Carlisle. After passing Carlisle, we soon get among the "glens" and mountains of the sister-country, still more wildly picturesque than those of Cumberland we have just emerged from. Annandale and Clydesdale appear to have suffered less from the peculiar inclemency of the season than the more level provinces of the south, owing, no doubt, to the rapidity with which heavy rains are removed. In both, the season is rather late, but yet promising. The elevated parts of this district are naturally late, but we hardly think the difference so great as we have seen on some former occasions. From the river Clyde to West Calder the country is poor, or rather perhaps capable of great improvement. Farmers are busy sowing oats—the principal crop; but much of the land is yet too wet for seed. From Midcalder to Edinburgh both the country and season are different. With the exception of small plots for barley, from which the turnips are only being removed or eaten off by sheep, the sowing of corn is nearly finished; and farmers are busy rolling, putting in potatoes, and preparing the lands for other green-crops. Young grass and winter wheats both look fresh and green, while the braid of spring-sown corn is coming away beautifully. Before entering Edinburgh we cannot help noticing the slovenly state of some farm buildings, conferring upon the county generally an appearance, in the eye of a railway traveller unacquainted with it, which it does not deserve—an appearance which says little for the intelligence of the farmers of Mid-Lothian, were it applicable to their different homesteads generally—a conclusion the reverse of which, we are happy to say, is true, although some amateur travellers from this country have arrived somewhat hastily at it. Exceptions so conspicuously situated certainly demand the immediate application of the pruning hook.

After leaving Edinburgh for the north, things appeared to be suffering more from the cold, blasting winds, especially in West Lothian and Stirlingshire; for where young plants enjoyed the shelter of plantations or fences they were considerably further advanced, the difference between the length of the sheltered and unsheltered amounting to from one to two inches. Upon the whole, however, things looked fresh, green, and promising, on all soils comparatively dry; while corn-seed time was

far advanced under favourable circumstances. In the Carse of Stirling vegetation had not made great progress, but was fairly started, fresh, and promising; and although the fallows appeared heavy to work, they were submitting to the influence of the harrows and roller. The Inches of Perth were remarkably green and promising, and so were the young grasses and winter wheats generally, so far as we could see, on both banks of the Tay, more so than in the Carse of Stirling. The fallows were equally hard to work. Between Stirling and Perth (the carse lands excepted) vegetation, although rather later than usual, was yet far from unpromising, especially about Auchterarder. Considerable damage has been sustained in this district from rivers and mountain torrents overflowing their banks; but where lands have not suffered from circumstances of this kind, or otherwise from imperfect drainage, farmers had made considerable progress in getting into the ground their oats and barley, the principal white crops cultivated. Much here has to be done in the straightening and embanking of rivers and their tributaries; and although this may be said to be the birth-place of farrow draining, from its proximity to Deanston, and the early attempts made to follow the example of the late Mr. Smith, much has yet to be done before the work is properly completed. What we have just said of things between Stirling and Perth we have now to say of things between Perth and Montrose onwards to Aberdeen, with this addition, that we are still proceeding northwards into a naturally colder, later, and less congenial climate. Vegetation, however, although somewhat later than usual, is yet not much behind an average state of health and forwardness at this season. While the calamities of winter will soon be got over, if the weather continues anything like favourable, one of the greatest losses sustained in Forfarshire, Kincardineshire, and Aberdeenshire has been the poaching of the lands in carting off turnips or eating them off by sheep. Since the introduction of guano and bone-dust the growth of turnips and the feeding of cattle and sheep have been prosecuted in these three counties with more than ordinary success. In them probably more of the produce of the soil is converted into butchers' meat than is to be found in any other three provinces of the kingdom; for although less corn is consumed than in some of our English counties, less is grown in proportion to the grass and other cultivated crops; while these, and almost the whole of the straw, is eaten by cattle, little going to the dunghill. Strathmore and Aberdeenshire have long been famed for the fine fat oxen they send to Smithfield; and the Grampian districts of Forfarshire and Kincardineshire, forming the northern barrier of "the great Strath," or valley, for its fine heavy breed of blackfaced sheep, yielding mutton of the finest quality perhaps in the kingdom, and often not much inferior in weight to some of our heavy English breeds, mutton which is keenly bought up by Edinburgh and Glasgow. Between Brechin and Fearn we passed some fine examples of this breed. Our journey in this direction was an extremely interesting one, extending con-

siderably beyond the parish church of Fearn, situated at the confines of the Grampians. In crossing the base of the hill, rising abruptly beyond the church, we passed over drifted snow several feet in depth; while the ravines on the sides of the hills more elevated were full of it, presenting a striking contrast with the black heath, giving to them a striped appearance, suggesting oftener than once, as we neared the end of our journey, the wild hyperbole of "the Grampians bleaching their linen." The wind was boisterous, and bitterly cold in the extreme, less than half way up the hill sides. Frequent showers of snow and hail fell during the day, while the tops of the higher hills were, for the most part, literally capped with clouds of snow. Towards the bottom of the glens birds were singing their happiest love strains, buds expanding, and vegetation progressing at a rapid pace generally. But our limits will not permit us to notice the animal, vegetable, and mineral productions of this fertile and enchanting district, which had been visited only the day before by an ex-Lord Mayor of London. For this purpose we must entertain the pleasure of a second visit. In Aberdeenshire seedtime was about half over, in Strathmore rather farther advanced. In both districts we have seen things looking worse at this season of the year, and less said about it than at present. From Edinburgh to Berwick farmers were making the most of a good seed time. In East Lothian things had suffered less from frosty winds than in West Lothian, and hence were looking fresher, greener, and further advanced—a state of things usually experienced. Things are, no doubt, later than they otherwise would have been had a different month of March been experienced, but at present there is nothing which affords farmers any occasion to grumble save their own shortcomings; and, in this far-famed district, these are farther between than in some others we passed through. Between Edinburgh and Dunbar there are few exceptions; crops generally promising, and also lambs. Between Dunbar and Berwick things are not so promising, generally speaking; it is seldom or never that they are so. The soil and climate are different, requiring a larger investment of capital in draining and manuring before an approximation can be made to equality. There are, however, some exceptionable spots not far behind. About Tweedmouth, our note-book says—"fine fields, in good order, and looking well;" but further on, towards Newcastle, such a rule forms the exception, a good deal of suffering being sustained from the wetness of the season. At the same time, things are looking better than we expected to find them; while the freshness and verdure of the exceptional examples illustrate in a very forcible manner how far art can triumph over such casualties by means of drainage and other improvements. Between Newcastle and York things are more promising; still a very heavy loss is sustained from the want of proper drainage. Water must be more quickly removed from the fields; and before this can be done, not only must the fields be closely drained, but rivers and their tributaries must be straightened and deepened, so as to remove with the least delay the water from the arterial drainage of the fields themselves. There is along this line a wide diversity of the system of farming, with as wide a diversity in the prospects of the harvest; some farms being farmed in a superior manner, equal to any in the kingdom, while others are old style in every respect—the latter proving eyesores as to the general appearance of the county, like the slovenly homesteads of Mid-Lothian. From York to Doncaster, and onwards to Retford, we may say ditto—with this proviso,

that we are rapidly proceeding southwards, although progress in vegetation is not keeping pace with the degree of latitude; but from Retford to Peterborough greater progress has been made. We here enter upon a different kind of soil—one which has sustained less injury from the wetness of the season, and hence is warmer. The hedgerows now begin to appear green at a distance; the meadows afford a better bite—cattle are being turned out to grass, &c. The cold clays of Huntingdon are not so flattering. Vegetation, however, appears willing to advance; wheat, seeds, and winter tares, in some cases, are much spotted, but blanks may yet fill up under ordinary weather. Things on the green sand and chalk soils are much more promising; on the London clays, about equal on the uplands. Things in the valley of the

Ouse have not wholly overcome inundations of early spring and winter, and are behind the Essex and Kent marshes.

Such is a very cursory glance, retrospectively, over a journey of a thousand miles among our provinces during the last ten days. The severe weather of March everywhere experienced has checked the progress of vegetation in a greater degree in the south than in the north, so that there is not that difference between provinces which is generally to be seen at this season of the year; consequently, if a dry early summer ensues, the southern provinces may suffer, and also the extra wet lands of the north; otherwise little loss, comparatively speaking, may be sustained. The general prospects of the north are flattering.

## W A G E S. — N o. I V.

### THE EQUITABLE WAGE PRINCIPLE. THE LAW OF SUPPLY AND DEMAND.

I have now to direct attention to the operation of the law of supply and demand, with respect to the contract system; and with the same end in view as stated in my last letter, I wish to furnish some illustrations. A picture is often more effective than an explanation, in the same manner as example is superior to precept.

I might serve my purpose here by giving some scenes from a novel called "Alton Locke;" but as they might be deemed fictitious I will go to other sources. Would that they were fictitious! but they who have penetrated the surface of London life know them to be fearfully true. One's blood runs cold at the bare imagination of them.

The middle-man system is essential to the contract system. When a quantity of work, usually paid for by the piece, is put out in one "lump," it is frequently the case that the master will contract with one workman for the execution of the whole, giving him a certain price for the job in the lump. If this work consists of distinct operations, requiring division of labour, the contracting workman seeks help, and seeks it where he pleases: here is then a middle-man. He may hand over the contract to a second trading operative, and then we shall have a second middle-man. Master and middle-man have each his own interest to look after, and his own profit to secure, and with one general result—*lower wages to the workmen*. The greater the number of these middlemen the greater the reduction of wages, for they scheme and trade upon the labour of their fellows. The following account was furnished to Mr. Mayhew by the foreman to a large speculative builder:—

"The way in which the work is done is mostly by letting and sub-letting. The masters usually prefer to let work, because it takes all the trouble off their hands. They know what they are to get for the job, and of course they let it as much under that figure as they can; all of which is clear gain, without the least trouble. How the work is done, or by whom, it's no matter to them, so long as they make what they want of the job, and have no bother about it. Some of our largest builders are taking to this plan; and a party who used to have one of the largest shops in London has, within the last three years, discharged all the men in his employ (he had 200 at least), and has now merely an office, and none but clerks and accountants in his pay. He has taken to letting his work out, instead of doing it at home.

The parties to whom the work is let by the speculative builders are generally working men, and these men in their turn look out for other working men, who will take the job cheaper than they will. And so I leave you, sir, and the public to judge what the party who really executes the work gets for his labour, and what is the quality of the work he is likely to put into it. The speculating builder employs an overlooker to see that the work is done sufficiently well to pass the surveyor—that's all he cares about. Whether it's done by thieves or drunkards, or boys, it's no matter to him. Thus the first contractor has scarcely any trouble whatsoever; he merely engages a gentleman, who rides about in a gig, to see that what is done is likely to pass muster. The sub-contractor has a little more trouble; and so it goes on as it gets down. Of course I need not tell you that the first contractor, who does the *least* work, gets the *most* of all; while the poor wretch of a working man, who positively executes the job, is obliged to slave away every hour, night after night, to get a bare living out of it. And this is the contract system."

The difference in estimates sent in for public or other buildings is amazing, and to the uninitiated it is a matter of perplexity. In the case of a church to be erected, one estimate is perhaps £500, and another £3,000! If we extend our examination we come to the truth that there are two distinctions in trades—namely, the "honourable trade," doing work in first-rate style, and paying the "honourable" rate of wages; and the "under-working," "scamping," "under-letting," or "slop" trade, bent upon securing the work, and living at the expense of the poor operatives.

Before the Select Committee on Army and Navy Appointments, Mr. Pearce, the army clothier, gave the following evidence:—

"When the contract for soldiers' great coats was opened, Mr. Maberly took it at the same price (13s.), in December, 1808: this shows the effect of wild competition. In February following, Esdailes' house, who were accoutrement makers, and not clothiers, got knowledge of what was Mr. Maberly's price, and they tendered at 12s. 6d., a month afterwards. It was evidently then a struggle for the price, and how the quality the *least good* could pass. Mr. Maberly did not like to be outbid by Esdailes (*Esdailes stopped subsequently*), and Mr. Maberly bid 12s. 6d. three months after, and Mr. Dixon bid again, and got the contract for 11s. 3d., in October: and in December of that year another tender took place, and Messrs. A. and D. Cock

took it at 11s. 5½d., and they *subsequently broke* In this way it went on changing hands. Presently, although it was calculated that the great coat was to wear four years, it was found that *those great coats were so inferior in quality that they wore only two years.*"

Mr. Shaw, another army clothier, a gentleman much alive to the evils of the contract system to the under-paid and over-worked operatives of his trade, addressed a letter to the chairman of the committee in question. The following are extracts from it:—

"My Lord, my object more particularly is to request your Lordship will submit to the committee, as an evidence of the evils of contracts, the great coat sent herewith, made similar to those supplied to the army; and I would respectively appeal to them as men, gentlemen, as Christians, whether five-pence, the price now being given to poor females for making up those coats, is a fair and just price for six, seven, and eight hours' work.

My Lord, the misery amongst the work-people is most distressing—of a mass of people, willing to work, who cannot obtain it, and of a mass, especially women, most iniquitously paid for their labour, who are in a state of oppression disgraceful to the legislature, the government, the church, and the consuming public. I would therefore humbly and earnestly call upon your Lordship to recommend an immediate stop to be put to the system of contracting now pursued by the different government departments, as being one of false economy, as a system most oppressive to the poor, and being most injurious in every way to the best interests of the country. Some of the men will tell you they are tired of life. Last week I found one man making a country police coat, who said his wife and child were out begging!"

I shall rest satisfied with adding another instance only to those already adduced. It tells against the law in question as far as it is known to operate in the rural districts. My authority is the Report on the Employment of Women and Children in Agriculture, and the object of my displeasure is the gang system.

Castleacre, in Norfolk, is what is called an "open" parish—i.e., it is in the hands of a considerable number of proprietors. The parishes that surround it are "close"—i.e., owned by one or two men. In these latter no new cottages are built, and the old ones are allowed to fall into ruin, in order to prevent the increase of birth settlements, and to keep down the poor's rates. The population gradually expelled from these parishes is forced elsewhere, and the resting place is usually Castleacre. From two causes—viz., the excess of labourers in Castleacre, and the defect of them in the neighbouring parishes—sprang the gang system of employment. There are gang-masters who reside in Castleacre. To these the farmers apply, and get their work done "well, quickly, and very cheaply." "And so the system spreads by degrees," says Mr. Denison, one of the commissioners, "throughout Castleacre itself, and over all the neighbourhood; and as it proved very beneficial to the employer, more labourers were continually either driven or drawn to Castleacre, in order to get work in the gangs, till at length the parish has become to use the expression of a gang-master) 'the coop of all the serapings in the county.' If a man or woman do anything wrong, they come here; and they think, by getting among them here, they are safe." This system is directly advantageous to the employer, "because he gets his work done

quickly, effectually, and very cheaply;"—and to the gang-master, "because it makes him a master, instead of a labourer," because it gives him local power and patronage, and "because it enables him to make money, not only as gang-master, but as vendor of necessaries to the members of gangs."

This system is disadvantageous to the employed, "because it is a mode of getting out of them the greatest possible amount of labour in a given time, for the smallest amount of pay; for as the gang-master contracts to do a job by the piece, he makes his gang work as hard by compulsion, as they would do freely, were they working by the piece on their own account; while in reality they are no more than day labourers, receiving day labourers' wages." The farmer thus gets his work done as quickly as though it were done by the piece; the gang-master gets the extra profit which the labourers usually derive from piece-work; meanwhile the labourer undergoes all the toil of piece-work, without any of its extra compensation." It is disadvantageous with respect to children, who have to walk far, and work beyond their strength. It is disadvantageous to the character of the women who work in these gangs (for the sexes are mixed), many, alas! becoming prostitutes. It is disadvantageous in that it throws the whole labouring population into the power of the gang-master, who, if he be a brutal, hard man, illustrates the proverb that no tyranny is so grinding as that of "a poor man, who oppresseth the poor." "He has neither the will nor the power to mend much their condition; he may, on the other hand, exact any amount of toil from them, on any conditions he pleases." Of one of the gang-masters, a woman giving evidence, says—"He keeps a flour shop, and forces all his gang to deal with him," &c. The chief gang-master has four or five overseers; he has 100 people in his employ (here is the middle-man system with a vengeance!); "boys and girls work together, and it's my belief that it's the ruin of them: they never settle to anything after it." But I need not go on to give extracts from the evidence against this miserable system, furnished by farmers, clergymen, and labouring people in the neighbourhood. Its vicious tendencies are borne upon the face of it. The advantages and disadvantages of its operation, to the one class and to the other, apply equally to the system as we have seen it developed in the trades' populations. I see no good in legislating to counteract this state of things. The attention of the public and masters generally must be drawn to it, and sympathy should be brought into direct contact. An interest must be evinced by the capitalist in the workpeople greater even than that evinced in the quality and the quantity of their work. The responsibility of that man is great who breaks asunder the kindly ties that bind together man and man, in one common brotherhood, and lives and acts and pursues his selfish money-getting course, regardless of the wants of the poor (who help to build up his fortune), or the cries of the fatherless! Oh! the vast heartless sacrifices that are daily and hourly offered up, of human blood and human tears, to the great god GOLD, which we have set up in our streets and market-places! How true is the Divine proverb, "He that maketh haste to be rich shall not be innocent!"

F. R. S.

## SHEARING OF FAT SHEEP FOR SMITHFIELD.

Very heavy complaints are now being made by both salesmen and butchers about the early shearing of fat sheep for Smithfield. It is not for the want of the wool that complaints are raised, but because the sheep themselves suffer from the extreme coldness and wetness of the season. Mutton killed in the wool is worth more money than mutton killed out of it; and the value of the mutton is not only depreciated in quality, but also in quantity, for the daily waste upon a naked sheep in cold wet weather is much greater than that upon the sheep well clothed in its wool. Although sheep endure a high degree of cold when dry, as they often experience in elevated situations during winter, without suffering much, it is only because nature has made ample provision for contingencies of this kind; but remove the provision which nature has made, and there is perhaps none of the domesticated animals so liable to suffer from cold as the sheep, especially in wet weather, owing to its excitable and nervous disposition. Moreover, the deterioration of quantity and quality is not the only consequence which the practice involves, for it also increases the commercial value of sheep sold in their wool by diminishing the supply of the best quality of mutton offered in the market, while it has a counter-tendency to lower the value of inferior qualities by increasing the supply. For instance, for the last few weeks (see *Mark Lane Express* of the 14th and 21st of March) it has been estimated that about one-fourth of the sheep on sale were out of their wool, or about 5,000 weekly, including the two market-days, which number few of the principal butchers having a family trade would look at. Hence, the keen scramble among them for the best lots in their wool, owing to the general supply being short; while another class of butchers have not experienced the short supply of mutton so much as they otherwise would have done, because the 5,000 shorn sheep have been added to their supply. In short, the subject becomes more and more important the further we advance in it, demanding specific consideration, according to the various interests of the several parties involved.

The farmer is the first party whose interest demands specific consideration; and the superior quality of the wool is, doubtless, the basis of his theory—he can get so much more for the wool when shorn than can the butcher for it upon the skin; and the difference in these piping times of economy is a profit worth the looking after. What this difference actually is, we have not been able satisfactorily to ascertain, although no little inquiry has been made. Indeed, in cases of this kind, when opposite interests are involved, it is no easy matter getting at the facts with sufficient accuracy on which to found a stable superstructure; for butchers who buy in the wool say that the prices in the Smithfield reports are much under the truth, *i. e.*, that they are paying more money than is reported, while the quotations for sheep out of the wool are the reverse, the butchers' prices being con-

siderably less than the reported prices. Granting, however, for the sake of argument, that the above is correct, it does not follow that the theory of the farmer is erroneous on that account; for, from time immemorial, it has been an authenticated fact, that wool shorn from the back of the live sheep is of more value than when shorn from its dead skin, owing to the effect produced on the alimentary system by death, arising from the instantaneous stoppage of the circulation. And, besides this, the wool suffers from being incorporated with foreign substances of various kinds while in the lairs, market, slaughter-house, &c., all tending not only to deteriorate its quality, but to increase the expense of washing and bringing it to market in a profitable state.

The interest of the butcher who buys shorn sheep at this season of the year is a simple affair when separated and considered by itself—being merely a plain question in commerce—for he is a practical man guided by experience in all the departments of the trade; so that if he gives a halfpenny too much this week, he just balances his account by placing it on the opposite side of his ledger next week. Customers generally speak their minds freely; and as his belong for the most part to the ready-money class, who look for the full of their hand, with a passable appearance at little money, success depends entirely upon turning the penny so as to keep the balance on the right side of the ledger. There is no speculation with him: so long as he has plenty of thick meat on his stall for little money, he will always find it surrounded with customers. Now, dropping the butcher-meat view of the question, and taking up the items of skin and wool only, the prices which he at present realizes for these are for pelts or skins without wool, from 1s. to 1s. 6d., or, on an average, 1s. 3d.; a very high price be it observed—6d. being a more common figure for them when newly-shorn; and for the skin with the wool on, from 5s. 6d. to 10s. 6d., or, on an average, 8s. per skin. So that an allowance of 6s. 9d. is made for the wool, or about 1s. 1½d. per lb., supposing the fleece to weigh 6 lbs. He gives 6s. 9d. less for the shorn sheep than for the sheep in its wool, and gets 6s. 9d. less for the skin, and is a gainer by the transaction—having less capital invested in trade; for for every six sheep he could buy in the wool, he can buy perhaps seven out of the wool. There is a greater difference, however, between the shorn and unshorn sheep than 6s. 9d.; for, even according to the Smithfield report, where the difference is said to be too little, it amounts to 1s. per stone of 8 lbs.; and probably eight stones are nearer the average weight of sheep than six and three-quarters. Now, if we take eight stones as the average weight, it will give a difference of 8s. in the price of the sheep, and, as the pelt is included in both cases, it consequently follows that this difference must either be accounted for in the value of the wool or decrease in the weight or quality of mutton. We have

seen that the difference allowed for the former is 6s. 9d. (a very high price), and therefore there must be a defalcation in the latter two of 1s. 3d. (the value of the pelt), or about 2lbs. of mutton—a defalcation which will subsequently be shown to be a long way under the truth. The market value of shorn sheep is also affected, as has already been shown, owing to the increase which takes place in the supply of that quality to which they belong, and the reduction of price decreases in a less ratio than the increase of supply, owing to the greater advance which takes place in the price of the best quality of mutton in the wool, because this advance induces many to look to articles of a more inferior quality than that to which they have been accustomed, increasing thus the demand for shorn sheep mutton—a conclusion somewhat against the objection of some butchers, the price of mutton out of the wool being reported in the newspapers above what it actually realises to the seller.

The interest of the butcher, who has got a family trade to control, as about the west end of the metropolis, is a more critical question; for at all seasons and under all circumstances, the demand of his customers is of a choice and select character, especially at this season of the year, when parliament is generally assembled, and therefore his supply must be accordingly. It is only the choice parts that he can dispose of at any time; and when he buys live sheep or bullocks, the inferior parts have not unfrequently to be consigned to the dead-meat market, to be purchased by those whose trade comprises a cheaper and inferior article. Fineness of flavour, grain, and quality generally, are things which he must never lose sight of. The butcher who sells the low-priced inferior article may often get rid of a bad joint without experiencing any unfavourable consequences from it. What is common is seldom much thought of; and from the perishable character of butcher-meat, and the liabilities of all parties to mistakes, butchers get into the familiar knack of not unfrequently fathering their own mistakes upon their customers. But a more guarded and dignified policy must characterise the commerce of the family butcher; for the palming off a bad joint, or anything inferior, would be to him the sacrifice of a whole establishment. In short, what his customers want he must have, cost what it will; while they are generally as particular about the price as any one. One of her Majesty's butchers in the west end told us, that if he had the offer of two sheep, the one in the wool at 10d. per lb., and the other out of it at 6d. per lb., that he must take the former at 10d., if he should not get more than 9d. for it; that he has frequently of late had to submit to transactions of this kind, and hence is obliged to charge a higher per-centage on his meat generally throughout the year for profit than he otherwise would do; and that were it not that a good supply is generally to be found in the dead-meat market at this season of the year, he would have greater difficulty in supplying his customers with the proper quality—for from Newgate market he gets a very large proportion of his present supply for his principal families. Such were the statements of the butcher—statements amply corroborated by inquiries subsequently made. A private hotel-keeper, for instance, whose house is visited

by a very large circle of our nobility and gentry—himself long in service, one of the most eminent and successful cooks which England has to boast of—told us that so essentially necessary was it to attend to economy of price on the one hand, and first-rate quality on the other, that if he did not get from his butcher a supply suitable to his demand, he would attend Newgate market himself; and that on several occasions he had got Welsh mutton direct from its native mountains, of the proper flavour and quality to which he knew individual families had been accustomed. The interest of this class of butchers, therefore, may be more easily imagined than described.

Such is the interest of the farmer and the two classes of butchers above noticed; but it is the public interest which will best elucidate the subject. In all ages England has been called upon to protect her interest in wool and butcher-meat, and she may again be called upon for legislative interference; for the progress which modern science is making has its own peculiar demands, while butchers and farmers are not the most willing to join in the march of improvement. Under the head of Wool, in her Majesty's statute-books of the realm, there is a longer list of statutes than under any other article, and modern reform may add to its length. In the days of Edward III., it was enacted, that "In every county there shall be assigned two great and good men to hear and determine offences." At this period it appears that farmers had been in the habit of selling their wool before it was shorn, probably for exportation and to evade taxes; for the 4 Edward IV. c. 4, provides, that "Whereas by subtle bargains made in buying of wools, before that the sheep that bear the same be shorn, the cloth-makers of this realm can well nigh find none to be sold, to the great grief of them which have been accustomed to have their living by the means of making cloth," &c., &c., a statute confirmed by the 37 Henry VIII. c. 15, sec. 4, which declares that agreements for wool unshorn shall be void, except by clothiers, &c. But although farmers and butchers are still unfortunately sticklers to many old customs, unwilling to join frankly in the progress of chemical and mechanical improvement, yet agricultural science is obviously entering upon a new era of its existence, which may demand a freedom of action from the legislature which it does not enjoy in the marketing of its produce, being subjected to the close-borough habits of antiquated times, so that farmers may yet shear their own fat sheep, and sell their own wool and mutton to the best advantage—a result not obtained at present for the want of the necessary means.

The interest of the public is briefly this—that farmers send to market their wool and mutton of the best quality and largest quantity grown. Neither wool nor mutton should be allowed to suffer depreciation at the hands of either the seller or buyer; but, on the contrary, the wool should be sold of equal value which it possesses on the back of the sheep before it leaves its sheep-walk, pastures, or pen at home for market, taking into account the economy of labour in shearing, while the economy of mutton and offal should be similar.

It will readily be granted that no one can shear the



sheep so economically as the farmer, or dispose of the wool to better advantage. To advance argument in support of this proposition would be superfluous; for the shepherd has always got his sheep-shears and stool beside him, while the farmer can also dispose of the wool of his fat sheep along with his general clip without incurring any extra expense. The economy of wool therefore, in the wool department of the subject, is a settled question; and it is one which must ever command the highest respect, as it has done in all ages, where sheep husbandry is followed.

To preserve the quality and quantity of the mutton, therefore, is the grand problem for solution, so as to silence the complaints of the butchers and satisfy the demands of the public. "To find out the seat of the disease," it is said, "is to effect half a cure;" and in accordance with this maxim, before attempting to prescribe a remedy, the effects produced on the mutton by shearing in cold weather, or even exposing newly-shorn sheep to the burning rays of a summer's sun, will be briefly glanced at.

In elevated sheep-walks, as in Scotland and Wales, flocks generally take a sufficiency of exercise to keep up the circulation of the system during the rigours of winter; and the activity which they manifest so long as they are masters of the storm is very conspicuous, but the moment they are overcome they are the most helpless creatures imaginable, requiring no ordinary exertion on the part of shepherds to keep them in motion. If caught by the tempest, they are driven before it in spite of almost all opposition, allowing themselves to be swept over precipices with indifference to consequences. If any degree of shelter can be obtained, they immediately embrace it with equal indifference to consequences. If it is a dry snow storm, they will endure it for a considerable length of time; but if sleet, so as to wet their skins, they soon sink under it; and if taken and slaughtered in those cases they never bleed well, from a half to two-thirds of the blood remaining in the system, and sometimes more. Such is the condition of the sheep when in its natural state; but when fed artificially it loses much of its natural characteristics, and is much more easily conquered by the adverse extremes of weather. The Southdown, for instance, one of the most lively and active of our breeds, although it will endure with little injury very severe storms on its native downs, is yet easily overcome when taken up and fed for the butcher. When newly shorn, its mutton is easily injured by both cold and heat during the extremes of winter and summer, owing to the inactive state into which it gets—its whole system becoming torpid during winter, and broiled during summer. On its native pastures it flies for shelter from the blasting influence of the former and scorching sunbeams of the latter to some rock, stone, tree, fence, or the like; but when driven to the market, it will stand exposed, with its back arched, to the piercing winds of winter and spring, and its panting sides to the full blaze of summer, with a listless indifference to either very interesting. Hence the consequences which follow. To expect that a sheep would die well under either of these circumstances would be madness in the extreme. If shorn several days before being

sent to market, the farmer may give it the benefit of a good sheltered hovel, or it may have been fattened under cover, as many sheep now are in pens; under either of which circumstances it may jostle and jump about, breathing quicker, and consuming more food, to keep up the heat of the body, but at the same time losing some 2lbs. daily of weight in very cold weather, such as the present week experiences; and when sent to Smithfield, stand in a state of torpid stupor, pitiful to behold, as we beheld many of this breed standing yesterday (Good Friday), and also on the Monday preceding. When killed, it may stand the weight it had when newly shorn, the loss being counterbalanced by imperfect bleeding; *but what is the quality?* To parties who have no knowledge of better, it may appear fine thick meat; but its flavour would not be relished, we are afraid, among some of the families of the west-end, whose judgment is different. Imperfect bleeding, however, is not the principal injury which the mutton sustains, for the whole system is not unfrequently in a high state of fever, with a heavy discharge from the nostrils, while the weakly lungs of flat-sided sheep are less or more affected. Moreover, from the cold closing the pores of the skin, the secretion of the yolk is checked; hence this pungent article is also mixed with the meat along with other substances discharged from the pores of the skin when in a healthy state. It is no wonder, therefore, that her Majesty's purveyors prefer giving tence for mutton in the wool to sixpence for mutton out of it, for the reason is very obvious: frosted or sunburnt mutton can never be relished.

Sheep in the wool, however, have their own calamities to experience in Smithfield, and all our other live stock markets, for fat stock at this season of the year, as well as sheep out of the wool; for the warmth and weight of their fleeces often drench them in perspiration to a very exhausting degree, and, although such may not injure the mutton so much as cold, yet it has an injurious influence upon the quantity and quality of it, as well as upon the wool; for the perspiration is often considerable, the fleece being as wet as if the sheep had been newly washed, so that a diminution of weight to the extent of several pounds must be experienced, while the degree of excitement which always accompanies such a state of perspiration must affect the quality. In extreme cold weather, again, such as the present week, they not unfrequently suffer from cold after such drenchings, the transition being so sudden as to prove very injurious to the meat.

Such is the compound malady under which our present system of marketing fat sheep labours, so to speak, and the remedy which we now prescribe is of a three-fold character. First, as soon as the fat sheep can be shorn successfully, shear it; then slaughter immediately, and consign to the dead-meat market, which secures not only wool and meat of the best quality and greatest quantity, but also an invaluable source of manure in the offal, worth probably more than the wool and pelt together in the generality of cases—a source at present shamefully neglected, for the farmer not only gives away the offal (the skin and tallow excepted) for almost

nothing, but that very offal, the very essence of manure, becomes a source of pestilence to all our large towns from putrefaction in the common sewers and about slaughter-houses. About 100,000 tons of manure is thus annually wasted in the metropolis alone, and probably six times as much in the provinces; so that what would enrich the country to the extent of many millions annually in the increase of produce, is thus the most baneful source of poverty to all our large towns. But besides the offal, the increase of the value of wool and mutton would be considerable; for mutton, which has stood the ordeal of the railway and Smithfield, with its separate system of lairage and slaughter-houses scattered over the almost boundless superficies of an overgrown metropolis, can never have the same flavour as mutton killed, cooled, and set in the pure atmosphere of the country, in the most healthy state, being free from cold, heat, or any of the exciting and injurious causes already noticed. Experience has already taught butchers the soundness of this conclusion, for they almost unanimously admit that the choicest pieces are got from Newgate Market, which they invariably attend, some of them every morning, to our knowledge, at a very early hour. The hotel keeper already referred to told us that when he went himself to select any choice piece, whether beef or mutton, it was invariably cut from a carcass or quarter from Newgate Market, slaughtered in the country. In short, facts like these speak for themselves, deducing conclusions easily understood by practical minds.

Secondly. The next remedy prescribed is for farmers to shear their fat sheep as formerly, and then to provide artificial clothing to be worn afterwards during the period of marketing until slaughtered. We do not see any reason why fat sheep should not be clothed as well as dogs and horses; and we have no doubt that the orders of butchers and farmers would be punctually attended to at "The World's Pharos" by E. Moses and Son, and quadrupeds as successfully and economically fitted and protected from the extremes of weather as bipeds now are.

There are, no doubt, many objections which could be started against the reduction of such a proposition to practice, objections which could as easily be refuted as stated. What is the novelty, we should like to know, which some old-fashioned folks will not object to? The very idea of sheep-jackets itself is enough to stumble the intellect of many an honest farmer, butcher, or salesman, who cannot see progress beyond the present system of Smithfield.

Thirdly. Let fat sheep be sent to market in the wool. Let the construction of the market be such as is recommended in "Blackie's Cyclopaedia of Agriculture," under the article "Smithfield," where the animals are conveyed by railway into the area of the market, housed in well ventilated pens, and there sold, being fed prior to the hour of sale by the farmer, and subsequently until taken out to public slaughter-houses adjoining to be slaughtered by the butcher; let them be shorn immediately prior to being taken out to be slaughtered; and let the offal be farmed with the same regard to manurial economy as stated under the first remedy. In short the treatment of the mutton, wool, and offal is the same in every respect under the first and third remedy; the principal difference in practice which would be experienced being the purity of the atmosphere, and less nervous excitement of the sheep in favour of the former—a very important difference, as every one who has had any experience in feeding and slaughtering for private families will readily perceive.

Such is the subject involved in the shearing of fat sheep for Smithfield at this inclement season of the year, and also exposing newly-shorn sheep to the broiling sun of summer, with the several remedies presented to obviate the evils complained of. The subject, it will be perceived, involves not only the economy of wool and mutton, but also of the offal as manure; and hence is levelled against our present system of commerce in live fat-stock, altogether pointing to the carcass trade as the more economical system for all parties, a system greatly on the increase. B.

### NECESSITY FOR AN ANNUAL GOVERNMENT SURVEY OF THE PRODUCE OF THE SOIL OF GREAT BRITAIN AND IRELAND.

In the early part of last year we drew the attention of our readers to the importance of having an annual government-survey of the produce of the soil of these kingdoms; and as the question seems now to have attracted more of the attention of the public, we purpose again to recapitulate our arguments on the subject, as there are few questions of more importance to the proper regulation of commerce.

When it is considered that the value of an average harvest has been estimated by M'Culloch at upwards 120 millions sterling, so far back as in the year 1846, some idea may be formed of its magnitude.

This 120 millions sterling was then apportioned as follows:—

In Wheat .....	18,225,000 qrs. valued at	£34,591,784
Oats and rye ..	20,869,049 "	" 20,869,049
Barley .....	7,940,476 "	" 10,502,499
Beans and peas	1,735,715 "	" 2,430,000

48,770,240

Ireland, 1,400,000 acres potatoes,	
at £8 .....	£11,200,000
England and Scotland, 4,400,000	
acres, with potatoes, turnips, and	
clover .....	30,000,000
Other crops and gardens .....	41,200,000
	<hr/>
	10,310,000
	<hr/>
	£120,683,332

Taking the above estimate as our basis, although a considerable increase has taken place since then in all except potatoes, is it not a matter of vital moment to know whether the crops have yielded an average, or  $\frac{1}{4}$ th,  $\frac{1}{8}$ th, or  $\frac{1}{3}$ rd short of an average? If the deficiency is even but  $\frac{1}{8}$ th, we find that the country has to sustain a loss of upwards of fifteen millions sterling! But if it amounts to  $\frac{1}{3}$ rd, as it has frequently done, the enormous loss of 40 millions sterling has to be sustained; nor does the loss even stop here, for large sums of money are

required, amounting probably to fifty or sixty millions, to pay for additional supplies of foreign grain, diminishing the money circulation in the country by so much, draining the Bank of England of her gold; and, as a consequence, disorganizing our monetary system.

At the present moment, what reliable data have we for estimating the produce of the last harvest in these kingdoms? We have certainly seen estimates of the produce, but these have generally been drawn up by parties more or less connected with the corn trade, from reports furnished to them by persons also closely interested in the question, and they cannot therefore be relied upon with that confidence which should pertain to a question of such vital moment.

Let us suppose a case in which the estimates formed of a crop turned out to be too favourable, and that we found ourselves suddenly deficient in the supply of food, what resources have we to depend upon? Certainly the world is now open to us, and supplies can be procured for the mere expenses of transit; but still we should have something more certain, something more tangible within ourselves to fall back upon in case of need, for it will be readily admitted that if foreign countries saw we were really in want, they would make us pay very dearly for our supplies.

During the old system of the sliding scale there was always a large quantity of grain remaining under *Lond*, besides large stocks held in granary by the trade; but now the case is very different: the nominal duty of 1s. per qr. is paid upon all foreign grain as soon as it arrives, and both millers and dealers seem afraid, under the present system, to hold more than will suffice for a few weeks' demand. The consumption of breadstuffs has so enormously increased within the last few years, owing to the increased prosperity of the country generally, that even with a full average harvest in these kingdoms, a large supply of foreign grain is necessary to make up the deficiency.

The following table of the corn, meal, and flour (reduced to quarters) imported into Great Britain in the following years, will give some idea of our present consumption:—

Year	Total quarters imported	Value
1846	6,536,777	13,196,059
1848	" "	9,182,338
1849	" "	12,001,848
1850	" "	10,473,253
1851	" "	11,073,171
1852	" "	9,556,200

Thus it will be seen that, although the harvest of 1851 was considered a productive one, particularly as regards wheat, we required a supply of nearly ten millions of foreign food, in addition to the produce from our own crop, to keep the price of breadstuffs within moderate bounds.

The consumption of the various kinds of corn grown on the soil of the United Kingdom in the year 1846 (exclusive of seed) was thus divided by M'Culloch:—

Consumed by man.	Qrs.
Wheat .. .. .	15,000,000
Oats, rye, and maslin (a mixture of rye and wheat) .. .. .	13,700,000
Barley, for malting, food, &c. .. .. .	6,000,000
Beans and peas, as meal .. .. .	700,000
	<hr/> 35,400,000

2. Consumed by the lower animals.	
Corn (principally oats) used in the feeding of horses and other animals, in distillation, manufacturing, &c... .. .	18,000,000

Total consumed by man and the lower animals. . . . . 53,400,000

It is to be observed that the above calculation is of course exclusive of the 6,536,777 qrs. imported in 1846, and also of seed, of which from seven to nine million of qrs. are annually sown; so that we may fairly reckon the total annual consumption of the United Kingdom at little less than seventy millions of qrs. at the present moment. We submit, then, that it is a matter of the utmost importance to the commercial interests of the country to know, as correctly as possible, the quantity of breadstuffs available at home to meet this extraordinary consumption. No subject is more deserving of the serious and immediate attention of the Government. We are indeed really surprised that a regulation of such moment, and which has been in existence for years in other nations of much less importance than our own, should have been overlooked for so long a period.

If we are not mistaken, the establishment of the police force in every town, district, and barony in the United Kingdom, presents a machinery almost ready made, for procuring the proposed information; and it will readily be admitted, we should hope even by the police themselves, that they have ample time for prosecuting such an inquiry in an efficient manner. Already in Ireland we have had a system of "taking stock," such as we have indicated, in existence for some years; but owing to the great length of time that expires before its publication, its utility as a guide to our supplies of food is in a great measure destroyed.

To insure as great a degree of correctness as possible, it would be necessary, we should imagine, to make the returns compulsory upon farmers, and to adopt such measures as will insure faithful reports. We should be sorry to think that our agriculturists would require compulsion in the matter, or that they would be capable of giving any information which would defeat the object in view. We have no such idea; but in all cases of the kind it is of course necessary to guard against the caprices of individuals.

So long as the present uncertainty as to our home produce supplies continues, so long will both millers and dealers, under the system of free-trade, be afraid to hold any quantity of grain on hand; and the country will consequently be deprived of the four to five millions of qrs. of grain it used to have, as a *corps de reserve*, under the old *regime*, and which quantity, at the very least, we consider absolutely necessary as an available stock in case of any sudden or unlooked-for emergency occurring.—Belfast Mercantile Journal.

EDUCATED WHEAT.—A singular discovery has been made in France, by a M. Fabre, an humble gardener of Ayde, but of some local note as a botanist. The herb *agilops*, heretofore considered as worse than useless, grows abundantly on the shores of the Mediterranean. It produces a species of grain resembling wheat in form, but much smaller. In the year 1839, M. Fabre sowed a quantity of this grain, and he was struck by observing that the produce of it seemed to bear a close affinity to wheat. That produce he sowed the next year, and the yield was still more like wheat. He went on sowing the yield in this way year after year, and each year found a marked improvement in the produce, until at last he had the satisfaction of getting as fine a crop of wheat, and of as good quality, as could wish to be seen. At first he produced his crops in a garden, but his latter sowings were made broadcast in an open field. Thus, then, a wild and mischievous herb, which is particularly destructive to barley crops, can be educated into excellent wheat.—Literary Gazette.

## AGRICULTURAL BIOGRAPHY.

*(Continued from page 320.)*

## CXLIV.—A FARMER, 1775.

This author wrote "Essays relating to Agriculture and rural affairs," in two parts, illustrated with copperplates; Edinburgh, 1775, 8vo. This work is in five essays, which form a volume of 472 octavo pages of much variety of matter: as, enclosures and fences; embanking rivers; draining bogs; sowing grass seeds; pastures; fattening of animals; food of beasts; grasses and legumes. The essays were written by the persuasion of Dr. John Gregory of Edinburgh, and were finished after his decease; a varied knowledge is shown, but no practical advancement was promoted.

## CXLV.—THE SCOTS FARMER, 1775.

This name wrote "Select essays on agriculture, adapted to the soil and climate of Scotland;" Edinburgh, 2 vols., 8vo., 1775. This work comprises two octavo volumes of above 600 pages each, and comprehends a very large mass of most useful matter. Almost every farming subject is treated and elucidated, and a very sound practical opinion is subjoined to every discussion. The arrangement might have been more commodious, and the form of letters omitted, which always defaces essayistical matters. The preface and dedication being none, the author's position in society is unknown beyond the above designation.

## CXLVI.—HALES, 1775.

Hales wrote "Complete body of husbandry, containing rules for performing in the most profitable manner, the whole business of the farmer and the country gentleman;" 4 vols., price £1 1s. This work was advertised by John Bell, Edinburgh, who published the work of Lord Kames; but no other notice of the book can be found. The most probable author would seem to be "Dr. Hales," a celebrated person in physiology and natural history, who lived over the time of the advertisement of the work; but the Bibliotheca Britannica does not contain a book of that title among the works of that author. The libraries of the British Museum do not possess any book of that title, and Loudon's catalogue mentions no author of that name. Some two or three anonymous tracts on agriculture have intentionally slipped our notice; but no work is omitted that has an author's name attached, and the authority is always given, whence the notice is derived.

## CXLVII.—CLARKE, 1775.

Cuthbert Clarke, lecturer in experimental philo-

sophy, wrote "The true theory and practice of husbandry, deduced from philosophical researches and experience." To which is added "A compendium of mechanics;" illustrated with plates, London, 1775, 4to., price 10s. 6d. The author published a book on weights and measures, which was of repute at the time.

The dedication of the book on husbandry is dated from Durham, and addressed to the proprietors and occupiers of land. The intention is avowed to resolve the hitherto varied art of husbandry into a science, and to do so with propriety and clearness. The first section of the theory of agriculture very curiously introduces into the middle of it the form of cash accounts in ledger and general receipt books. Then follow the forms of receipts, bills, and the promissory notes, and common bills of parcel. The curvilinear shape of ploughed ridges of land are very correctly delineated, and the position of the furrow slices is very exact. A general conversation is managed between two speakers, "Philosophus and Agricola," who discuss the common topics of farming in an enlightened manner. A form of a lease is given, along with the expenditure and receipts on an arable farm of 300 acres. The second part of the work, on mechanics, delineates some forms of ploughs; but nothing new, or very worthy of notice. The Rotherham plough is shown with straight handles.

## CXLVIII.—ELLIS, 1776.

John Ellis, F.R.S., an eminent naturalist, was born in London about the year 1710; died in 1771. He wrote "A treatise on cattle," showing the most approved method of breeding, rearing, and fitting for use horses, asses, mules, horned cattle, sheep, goats, and swine; London, 1776, 8vo., price 6s. This work is not found in the National Library along with other works of the author, who wrote largely on natural history. The Bibliotheca Britannica makes the general statement.

## CXLIX.—MARSHALL, 1778.

William Marshall was a native of Yorkshire, and brought up to trade: the year of his birth has not been stated. He was some years in the West Indies as a planter, and returned in 1775, when he took a farm in Surrey. In 1780, he was agent in Norfolk, on the landed estate of Sir Harbord Harbord, which employment he resigned in 1784, and settled at Stafford, busily occupied in arranging and printing the works he had long been preparing,

From this time, or from 1786 to 1808, he resided mostly in Clement's Inn, London, during the winters, and travelled during the summers in different parts of the country. He finally retired, in 1808, to his native vale of Cleveland in Yorkshire, where he purchased a large estate, and died there in 1819, at a very advanced age.

The works of Marshall are as follow:—"Minutes of agriculture, made on a farm of 300 acres of various soils, near Croydon, Surrey." To which is added, a digest, wherein the minutes are systemized and amplified, and elucidated by drawings of new implements, farm-yard, &c. The whole being published as the sketch of the actual business of a farm, as hints to the experienced agriculturist, as a check to the present false spirit of farming, and as an overture to scientific agriculture; London, 1778, 4to., price 12s. "Experiments and observations concerning agriculture and the weather;" London, 1778, 4to., price 7s. 6d. "The rural economy of Norfolk, comprising the management of landed estates, and the present practice of husbandry in that county;" London, 1788, 2 vols., 8vo., price 12s. "The rural economy of Gloucestershire, including its dairy; together with the dairy management of North Wiltshire, and the management of the orchards and fruit liquors in Herefordshire and Gloucestershire;" Gloucester, 1789, 2 vols., 8vo., price 12s. "Rural economy of the Midland counties, including the management of live stock in Leicester and its environs; together with minutes on agriculture and planting in the district of the Midland section;" London, 1790, 2 vols., 8vo., price 14s. "A review of the landscape, a didactic poem: and also an essay on the picturesque, together with practical remarks on the picture ornament;" London, 1793, 8vo., price 5s. "Rural economy of the west of England, including Devonshire, parts of Somersetshire, Dorsetshire, and Cornwall;" London, 1796, 2 vols., 8vo., price 12s. "A practical treatise on planting and ornamental gardening;" 8vo. "Planting and rural ornament," being a second edition of the preceding work, with large additions; London, 1796, 2 vols. 8vo. Third edition improved 1808. "The rural economy of the southern counties of England, comprehending Kent, Surrey, Sussex, the Isle of Wight, the chalk hills of Wiltshire, Hampshire, &c., and including the culture and management of hops in the district of Maidstone, Canterbury, and Farnham;" London, 1796, 2 vols., 8vo., price 12s. To a second edition in 1798, was added "A sketch of the vale of London, and an outline of the rural economy, proposals for a rural institute or college of agriculture, and other branches of rural economy;" London, 1798, 8vo., price 1s. 6d. "On the appropriation and enclosure of commonable and intermixed lands, with heads

of a bill for the purpose; together with remarks on the outline of a bill by a committee of the House of Lords for the same purpose;" London, 1801, 8vo., price 2s. 6d. "An elementary and practical treatise on the landed property of England, containing the purchase and improvement of landed estates;" London, 1806, 4to., price 42s. "Treatise on the management of landed estates"—a general work for the use of professional men, being an abridgment of the former; London, 1806, 8vo., price 10s. 6d. "A review of the reports of the Board of Agriculture from the northern departments of England;" London, 1808, 8vo., price 12s. "A review of the reports of the Board of Agriculture from the western departments of England;" London, 1809, 8vo., price 12s. "A review of the reports of the Board of Agriculture, from the eastern departments of England;" London, 1812, 8vo., price 12s. "Review and complete abstract of the reports to the Board of Agriculture from the midland departments of England;" London, 1815, 8vo. "A review and complete abstract of the reports to the Board of Agriculture from the southern and peninsular departments of England;" 1817, price 19s. "A review and complete abstract of the reports to the Board of Agriculture from the several departments of England;" 1817, 5 vols., 8vo., price 60s. "Of the black canker caterpillar, which destroys the turnips in Norfolk;" Phil., Trans., Lib. XV, 386, 1783.

William Marshall had but little education, of which the want was supplied by a mind of no common strength and energy. He adhered to purpose with an invincible obstinacy, and an imperturbable steadiness; nothing could divert him from the plan which he originally laid down, that of collecting and condensing the agricultural practice of the different counties of England, with a general work on landed property; another on "Agriculture," which he did not live to complete, and a rural institute. The boards and societies which have succeeded do not realize the latter idea. It has yet to be done.

The writings of Marshall are very valuable, and as an author he must be preferred to Arthur Young. The matter is better arranged, and his practical knowledge was more correct: condensation was his object, as the want of it scattered the materials of Young. It is quite true, that compression is more powerful than expansion, and that condensation is desirable; but to abridge everything requires that an author sees everything, which is an attainment probably far removed from human reach. A certain degree of expansion is required in order to convey the meaning in the full force: if it be too diffused, it loses power; and if too confined, the opportunity of action is not conferred. Both Young and Marshall were inferior to James Anderson in the com-

prehensive grasp of the subject, which caught the essence, and let go the grossness, and looked at the object from a point of view that was divested of the crotchets and adventitious appurtenances which perplex and encumber almost every mind that attempts to delineate any practical application.

As a rational observer and practical compiler Marshall was most decidedly superior to Young.

The georgical element of the human race was very strong in Marshall, and it had a more correct development with him than was manifested by Tull or Young, or by any agriculturist that had preceded him. Almost every human being dirties his fingers with the soil in some shape or form; if the hand does not actually touch the soil, the eye observes, the mind ruminates, and the pen is used to communicate the ideas that arise on the use of the ground. Almost no profession has debarred its votaries from giving aid to agriculture: the lawyer has doffed his wig, the clergyman has laid aside his gown, and the sons of medicine have neglected the jar and the pestle, in order to contribute a mite to farther the good cause. And agriculture has been much indebted to their efforts.

#### CL.—FORBES, 1778.

Francis Forbes, Gent, wrote "The extensive practice of the new husbandry exemplified on various sorts of land for a course of years; and the importance of that husbandry to Britain, shown from long experience of several eminent husbandmen;" London, 1778, 8vo., price 9s. "The improvement of waste lands; viz., wet moory lands; land near rivers and running waters; peat land; and propagating oak and growing timber upon neglected and waste lands;" London, 1778, 8vo., price 9s.

Only the last mentioned work is found in the library of the British Museum. It is an octavo volume 210 pages, and is mostly composed of speculative projects, as canals, plantations of oaks and osiers, the cultivation of hemp, and other exotic ideas. The practical part is nothing. The author seems to have been a small landed proprietor.

#### CLI.—WIGHT, 1778.

Andrew Wight wrote "The present state of the husbandry in Scotland;" Edinburgh, 1778, 1790, 6 vols., 8vo. This work is formed from reports made to the commissioners of annexed estates, who were appointed to observe and report the progress of improvements on the allotted grounds. The author had compiled the work, or had travelled as an inspector; his name is not attached to the book itself, but has the title in every catalogue and library. The contents are valuable, and contain a mass of most useful information. Threshing machines were then used.

#### CLII.—BLACK, 1778.

James Black, of Morden, Surrey, wrote "Observations on the tillage of the earth, and on the theory of instruments adapted to this end;" London, 1778, 8vo., price 5s. The name of this author is not otherwise known. The book is a thin quarto of 40 pages, treating on ploughs, exhausting crops, soils, labouring cattle, and cultivation of waste lands. A long dissertation on the relative advantages of horses and oxen as beasts of draught, the prime cost and maintenance of each animal, is hardly able to establish the ox as superior to the horse, which seems to be the object of the calculation. The sketches of implements are little worth.

#### CLIII.—BOSWELL, 1780.

George Boswell, a landed proprietor of Gloucestershire, wrote "Treatise on watering meadows, wherein are shown the many advantages arising from that mode of practice, particularly on coarse, boggy, or barren lands;" with four copperplates. London, 1780, 1793, 8vo., price 2s. 6d. The book is a thin octavo of 108 pages, with a dedication to the Earl of Ilchester, dated Piddletown, Dorset, March 25, 1779. The chapters are fourteen:—I. On land capable of being flooded. II. An explanation of the terms, principles, and instruments, used in watering meadows. III. General description of water meadows. IV. A meadow watered regularly from a stream running through it. V. A meadow irregularly watered, the stream passing by the side of it. VI. A meadow watered by a head main taken out of the river a considerable distance above it. VII. Planning a meadow of eight acres, an actual survey. VIII. The execution, or manual part of the work. IX. Description of wares and sluices. X. The various erections in water meadows. XI. Land floods. XII. Repairing the works. XIII. Watering the meadows. XIV. Haymaking.

The plates show the watering of meadows in regular ridges, and also in irregular formations of ground, where the canals of water are guided by the inequalities. The essay possesses much merit, and has not been surpassed by the usage of the present time.

#### CLIV.—TRUSSLER, 1780.

Rev. John Trussler, LL.D. of Cobham, Surrey, a singular literary character and compiler, was born in London, 1735; died in 1815. He wrote largely on history, chronology, law, romances, and humorous subjects. He published on gardening, and also "Practical husbandry, or the art of farming with a certainty of gain, as practised by judicious farmers in this country, the result of experience and long observation." In this work is contained all the knowledge necessary in the plain business of farm-

ing, unincumbered with theory, speculation, or experimental enquiry; also a number of estimates of the expenses and profits of different crops in the common way, taken from minutes kept; and a variety of useful remarks, not to be met with in any books of agriculture, together with directions for measuring timber.

The above statement is the title-page of an octavo book of 160 pages, which is bound with other short works on agriculture. In 21 chapters, there are mentioned, soils, the team, wheat, barley, oats, buckwheat, beans, peas, tares, turnips, clover, course of crops, profits of an arable and grass farm, ploughing and harrowing, weeding, hedging and ditching, threshing, manuring, miscellaneous observations, price of labour, on measuring timber.

The net profit of an acre of wheat is stated to be £2 10s., and the produce of the grain at 2½ quarters; barley yields 4 quarters, and the profit is £3 3s. 6d.; oats produce 4 quarters, and the profit is £1 19s. 10d.; the produce of buckwheat is the same, and the profit is £2 19s. 1d.; beans yield 3½ quarters, and the profit is £1 13s.; peas yield 3 quarters, and the profit is £1 8s.; tares yield 2 quarters, and the profit is 11s. 4d.; and from a crop of hay £1 9s. 6d. A ton of turnips is valued at about 30s.; an acre of clover is worth 35s., when fed with swine at £11 9s. 6d., by hurdling £6 6s. 10d.; an acre of hay £1 7s. 9d. The course of crops is not scientific in having oats after wheat, and turnip fallow after the smothering crop of peas. A farm of 150 acres leaves a profit of £379, and an acre of meadow about £1 11s. The cost of threshing grains differs a little from the present prices.

The list of manures gives no addition of any notable substance. Meadows are advised to be mown and grazed alternately; an acre of turnips will winter eight sheep, and 2½ acres of grass. A long list is given of the prices of job work, and of daily labour.

This short treatise shows a very correct practical knowledge, and much sober sense. The calculations are just, and founded on experience: no animals are mentioned.

CLV.—HALYBURTON, 1782.

William Halyburton, D.D., wrote "Georgics," in a series of letters to a friend; Edinburgh, 1782, 8vo, price 6s. This notice is taken from the *Bibliotheca Britannica*, in which alone the name of the author is found. It is therefore not known if the book was in prose or poetry, if it related to the works of cultivation of land, or to other georgical performances.

CLVI.—RALEY, 1782.

William Raley, student in physic and botany, in Barnby upon the Moor, near Pocklington, Yorkshire, wrote "A treatise on the management of

potatoes, or a new method of preventing and removing the disorders thereof, called curled tops; with remarks on the usual treatment and application of potatoes;" London, 1782, 8vo., price 3s.

This essay occupies 43 octavo pages, and attributes the curl top to several causes:—as, low damp grounds; want of change of seed; too often planting on one place; and to the sets being too small. This treatise was followed by an essay on the right management of potatoes, which differs little from the previous work. The author recommends various preventives, which deserves notice.

CLVII.—TWAMLEY, 1784.

Josiah Twamley wrote "Dairying exemplified;" or the business of cheesemaking laid down from approved rules, collected from the most experienced dairymen of several counties, digested under various heads; from a series of observations, during thirty years' practice in the cheese trade. With the most approved mode of making butter, and a dissertation on pine-apples: Warwick, 1784, 8vo, 2s. The book occupies 142 octavo pages in one continued essay, without chapters or divisions. There is shown very much sound knowledge of the subject, and many judicious suggestions.

CLVIII.—TURNER, 1784.

Mr. Nicholas Turner, of Bignor, Sussex, wrote "An essay on draining and improving peat bogs, in which their nature and properties are considered;" London, 1784, 8vo., price 5s. The book is an octavo of 86 pages, discussing the origin of peat, its nature, and qualities in different situations. The expense of improvements is stated, the value of the returned crops, and the profits. It appears the author had never seen any true moss, but only reckoned upon mossy earths, and borrowed many statements from doubtful authorities. But his views are clearly stated, and very justly expressed.

CLIX.—COOKE, 1784.

James Cooke, inventor of a new drill machine, wrote "Drill husbandry perfected;" 1784, 12mo. This book is not found in the libraries of the British Museum, and the author is not placed in London's list of authors. The above notice is taken from the *Bibliotheca Britannica*, which is the sole authority for the insertion of the name. But it occurs to our memory that the work had been seen by ourselves, though nothing more can be recollected of it.

CLX.—SMALL, 1784.

James Small wrote "Treatise on ploughs and wheel carriages;" Edinburgh, 1784, 8vo. He held a small farm in Roxburghshire, whence he removed to the vicinity of Edinburgh, and became a noted machinist. He made great improvements on the Rotherham plough, and the mouldboard which he

devised and attached has not been much altered in that country, and is yet known by his name.

The libraries of the British Museum do not possess Small's treatise; but Loudon's list of authors joins with the *Bibliotheca Britannica*, in giving the above statement of the author and the book.

#### CLXI.—STONE, 1755.

Thomas Stone was a land surveyor in Gray's Inn, London, and land agent to the Duke of Bedford; died at Paris in 1815. He wrote "An essay on agriculture, with a view to inform gentlemen of landed property whether their estates are managed to the greatest advantage;" London, 1755, 8vo., 6s. "Suggestions for rendering the inclosure of common fields and waste lands a source of population and riches;" London, 1787, 8vo., price 1s. 6d. "General view of the agriculture of the county of Huntingdon;" London, 1793, 4to. "General view of the agriculture of the county of Bedford;" London, 1794, 4to. "General view of the agriculture of the county of Lincoln;" London, 1794, 4to. "A review of the corrected agricultural survey of Lincolnshire, by Arthur Young Esq; with an address to the Board of Agriculture, and a letter to its Secretary; and remarks on the recent publication of John Lord Somerville, on the subject of inclosures;" London, 1800, 8vo., price 8s. "A letter on the drainage of the east, west, and wild moor fens, addressed to the proprietors of marshes in Lincolnshire;" London, 1800, 8vo., price 1s. "Letter on the intended drainings and inclosures of the moor fens in the county of Lincoln;" 1800.

The essay on agriculture, which was probably the most valuable of Stone's professional works, does not appear in the libraries of the British Museum, nor do the letters on draining of the fens. The three county surveys are short statements of the farming, followed with suggestions for its improvement. The survey of Lincoln fills 105 pages of quarto size. The suggestions on inclosures fills 56 octavo pages, which argue strongly in favour of enclosing, and confute the opposite statements in detail. Stone had been a person of a rational attainment, and very sound judgment. Though he had never practised farming, his views are very enlightened, and deductions correct.

#### CLXII.—YOUNG, 1786.

David Young, of Perth, wrote "National improvements in agriculture;" in 27 essays, Edinburgh, 1786, 8vo., price 5s. "Agriculture the primary interest of Britain;" Edinburgh, 1788, 8vo., price 6s. This statement appears in the *Bibliotheca Britannica*, and Loudon's list of authors quotes the first work, and omits the second. The libraries of the British Museum do not possess a book or author of the name.

#### CLXIII.—CULLEY, 1786.

George Culley wrote "Observations on live stock, containing hints for choosing and improving the best breeds of the most useful kinds of domestic animals;" London, 1786, 8vo., price 3s. "General view of the agriculture of Northumberland;" along with J. Bailey. The name of Culley in three brothers emigrated from the county of Durham into Northumberland, and rented the farm of Fenton, near Wooler, in 1767. By introducing the improved Leicester sheep, and adopting the drill cultivation of turnips on these very favourable soils, and propitious climate, their fortune was rapidly extended; the border farm of Wark was long the scene of their operations, which ended in amassing a patrimony of landed estates to their posterity. Much activity and energy were displayed by the Culleys, which under less favourable circumstances might not have been so successful; but still great merit is due to the name, which yet exists in that county. The treatise on live stock has ever been very justly esteemed, and the county survey shows an enlightened mind: George Culley died in 1813, aged 79.

#### CLXIV.—WINTER, 1787.

George Winter, a practical agriculturist, wrote "A new and compendious system of husbandry; containing the mechanical, chemical, and philosophical elements of agriculture;" Bristol, 1787, 1797, 8vo., price 9s. The author was member of several learned societies, and writes the dedication of his book to the Duke of Beaufort from Charlton, Gloucestershire. The work is an octavo volume of 349 pages in 12 chapters on properties of different soils; the properties of manures, and their effects; the most advantageous method of applying manures on different soils; the improvement of lands; advantages of the drill over the old husbandry; a new culture shown, that is preferable to the old; experiments on different grains; experiments on turnips, with a cure of the fly; on fruit trees and flowers; on fattening hogs; on a drill machine; analysis of soils and manures. The author had possessed a superior mind, and a very enlightened understanding, though the work is far from being a compendious treatise on agriculture. Not half the points are touched at all, and some are nothing advanced; the drilling of crops is much advocated, and the large use of manures. A drill machine of 6 coulters is delineated, which shows the foundation of the modern implements. The author concludes "that a judicious application of manures, with a proper course of crops, and a thorough tillage, are the chief and grand secrets of agriculture."

#### CLXV.—LEY, 1787.

Charles Ley, land surveyor, wrote "The noble-



man, gentleman, land steward, and surveyor's complete guide;" in which is described every circumstance relative to the proper management of estates; comprehending the office and duty of a land steward, in all its parts, with some useful hints to surveyors; also the current prices of estates throughout the kingdom, by which any gentleman or steward may ascertain the exact value of any estate, whether in fee, copy, or leasehold. London, 1787, 8vo., price 3s. 6d.

The above statement appears in the *Bibliotheca Britannica*, and in Loudon's catalogue of authors; but the name of Charles Ley, or of the book, is not found in the libraries of the British Museum.

## CLXVI.—ADAM, 1789.

James Adam, Esq., wrote "Practical essays on agriculture; containing an account of soils, and the manner of correcting them; an account of the culture of all field plants; also on the management of grass lands; with observations on enclosures, fences, farms, and farmhouses;" London, 1789, 2 vols., 8vo., price 12s. The libraries of the British Museum do not possess this book, and no author of that name, on agricultural subjects; the authority for its insertion rests in the *Bibliotheca Britannica*, and on Loudon's list of authors. The absence of this work, and of the last mentioned author, is to be regretted, as the titles show something respectable, and agriculture was making very rapid strides. Our search could hardly miss the books, if written in the catalogue.

## CLXVII.—FALCONER, 1789.

William Falconer, M.D., F.R.S., was physician to the General Hospital, Bath. He wrote many professional works, which were much esteemed; and "An essay on the preservation of the health of persons engaged in agriculture, and on the cure of diseases incident to that way of life;" London, 1789, 8vo., price 1s. 6d. This book may not be reckoned an agricultural work; but the tools of action in any proceeding require an equal care with the modes and results of operations, and consequently demand a similar consideration. Living organisms claim the precedence of inert materials, and the cure is more heavy, and the value greater.

Falconer's essay forms a thin octavo volume of 38 pages of continued writing, without any division. The author discusses the employment of rural labourers, their diet, accommodation, and medical treatment. After describing the most common diseases and the necessary prescriptions, the author advises that all parish clergymen be so far educated in the medical art, as to prescribe in all cases of moderate affection, and that the professional man be fetched when the disease exceeds mediocrity. This arrangement would imply an increase of salary

from the landed property of the parish, as all services would be gratis. The benevolent justice of the intention admits no doubt, and a hope is expressed that the arrangement may soon be made. It is just, it is fair, it is equitable, nay it is imperative that labour be maintained in competence and comfort, by the fruits of its own exertions.

## CLXVIII.—WRIGHT, 1789.

Rev. Thomas Wright, Rector of Auld, in Northamptonshire, wrote "Account of the advantages and method of watering meadows by art, as practised in Gloucestershire;" London, 1789, 8vo., price 1s. 6d. "The art of floating land, as it is practised in the county of Gloucester, shown to be preferable to any other method in use in this country; with minute and plain directions, and three descriptive plates;" London, 1789, price 3s. 6d. "On the formation and management of floated meadows, with corrections of errors found in the treatises of Messrs. Davis, Marshall, Boswell, Young, and Smith, on the subject of floating;" 1800, 8vo., price 6s.

Only one of the above mentioned works is found in the libraries of the British Museum—"The art of floating land," which forms a thin octavo of 95 pages, with three plates of float-work. The writings of this author have always been favourably reported and justly esteemed. The author writes on the title-page, "Thomas Wright," author of *Large farms* recommended. This work is not noticed in any other place, and seems to have escaped the research even of the *Bibliotheca Britannica*.

## CLXIX.—CURTIS, 1790.

William Curtis, an eminent botanist, was born in Hampshire in 1746—died in 1798. He was author of several botanical works, during the time of his being lecturer at the Apothecaries' Garden in Chelsea, and is known as the founder of the *Botanical Magazine*. He wrote "Practical observations on the British grasses, best adapted to the laying down and improving meadows and pastures;" 8vo. This is a very useful volume, containing the portraits and characters of the best grass plants, with the use and practical management. No subsequent work has over done the merits of the book in the small compass it contains. The portraits are true in the likeness, and correct in the execution.

## CLXX.—CLARKE, 1792.

Charles Clarke wrote "Treatise on the earth, called gypsum; with an account of its extraordinary effects as a manure, cheap and more productive to vegetation than any hitherto made use of;" London, 1792, 8vo., price 1s. 6d. The name of this author appears only in the *Bibliotheca Britannica*, from which the above notice is taken; Loudon's list of authors does not print the name, and the

work is not found in the libraries of the British Museum. It may be contained in some volume of tracts, in which many similar treatises are combined to form a book. But the price being stated might infer a separate publication; probably in the first place, and afterwards joined with others.

## CLXXI.—MAY, 1792.

Thomas May wrote "Minutes of agriculture, and the description of machines and implements of husbandry, in reply to Mr. Cooke's annotations; London, 1792, 8vo. The Bibliotheca Britannica is the sole authority for the name of this writer, which does not appear in any other list or catalogue.

## CLXXII.—HUTTON, 1792.

James Hutton wrote "Principles and practice of agriculture" 2 vols., 8vo. This writer may be Dr. Hutton, the author of "The theory of the earth," whose works appear in every list of authors and library of books; but no notice is made of the above work. It is frequently advertised by booksellers of the lower degree.

## CLXXIII.—FRAZER, 1793.

Robert Frazer, Esq., A.M. wrote "General view of the agriculture of the county of Devon; with observations on the means of improvement;" London, 1792, 4to. "General view of the agriculture and mineralogy, present state and circumstances of the county of Wicklow; with observations on the means of improvement, drawn up for the Dublin Society;" Dublin, 1801, 8vo. "Gleanings in Ireland, particularly respecting its agriculture, mines, and fisheries;" London, 1802, 8vo., price 3s. "A letter on the most effectual means for the improvement of the coasts and western islands of Scotland, and the extension of the fisheries;" London, 1803, 8vo., 5s. "General view of the county of Cornwall, with observations on the means of its improvement, drawn up for the consideration of the Board of Agriculture;" 4to., London, 1794. These reports are well performed, and contain each about 70 quarto pages; Wicklow is by itself in a volume of 200 octavo pages. It is very sensibly written, and prospective moderate.

## CLXXIV.—SOCIETY OF GENTLEMEN, 1793.

This title wrote "The complete farmer, or a general dictionary of husbandry in all its branches;" London, folio, 1793. This dictionary contains the letters of the alphabet in the matters of agriculture, with many plates of implements, machines, and cereal plants. The book of this date is called the fourth edition; but the previous ones had escaped notice. The work is very creditable, and the authors belonged to a society for encouraging arts, manufactures, and commerce. The article on paring and

burning, called "burn-baking," is very sound and enlightened.

## CLXXV.—BAIRD, 1793.

Thomas Baird wrote "General view of the agriculture of the county of Middlesex, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal improvement;" London, 4to., 1793. This report occupies 51 quarto pages, and is without embellishments of any kind. The matter is well arranged, and very sensibly expressed. It was the first report of the county of Middlesex, and was followed by those of Foot and Middleton.

## CLXXVI.—DONALDSON, 1794.

James Donaldson, of Dundee, land surveyor, wrote "View of the Carse of Gowrie, in Perthshire;" London, 1794, 4to. "General view of the agriculture of the county of Nairn;" London, 1794, 4to. "General view of the agriculture of Elgin and Moray." "General view of the agriculture of the counties of Perth, Banff, Northampton, and Kincardine;" London, 1794, 4to. "Modern agriculture; or the present state of agriculture in Great Britain;" Edinburgh, 6 vols., 8vo., 1793-6.

Nothing is known of this author, except the above designation; the last-mentioned work is not found in the National Library, which contains the county reports. The author writes himself agent for the Earl of Panmure, and treats the subjects that come under his view in a very judicious and enlightened manner.

## CLXXVII.—SWAYNE, 1794.

G. Swayne, A.M., vicar of Pucklechurch, Gloucestershire, wrote "Gramina pascua, or a collection of the specimens of the common pasture grasses, arranged in the order of their flowering, and accompanied with their English and Linnean names, as likewise with familiar descriptions and remarks;" London, 1790, 9 pages and 4 plates, price 10s. This notice is contained in Loudon's list of authors, and in the Bibliotheca Britannica; but the work is not found in the National Library. No opinion has been known of its merit, and it may not have reached any celebrity.

## CLXXVIII.—SINCLAIR, 1794.

Right Hon. Sir John Sinclair, Bart., LL.D., M.P., founder and president of the Board of Agriculture, was born at Thurso Castle, in the county of Caithness, in the year 1754. He was the son of George Sinclair, of Ulster, heritable sheriff of Caithness, the representative of a very old and nobly descended family, that is originally from France. It came to England with William the Conqueror, passed into Scotland, and founded all the Scotch

families of Sinclair. The Ulster branch is one of the oldest from the parent stem.

The subject of this memoir, when he was 17 years old, lost his father, when his minority and education were superintended by his mother, Lady Janet Sutherland, who seems to have been a lady of very uncommon management. The son was sent to the High School of Edinburgh, and at the proper age attended the colleges of Edinburgh, Glasgow, and Oxford. This varied education very much improved his observant mind, and he ever afterwards acknowledged the benefits of the change. He early indulged in literary composition, and before he was sixteen had sent some effusions to the periodicals of the day. He returned to his native country from Oxford, and studied law—not professionally, but to gain an acquaintance with the national institutions. In 1775, he became a member of the faculty of advocates, and was afterwards called to the English bar. The circle of his acquaintance was thus increased, but no attachment was formed to the legal profession. He journeyed through France with an invalid brother, and was elected Member of Parliament in 1780, for his native county, and sat in the House of Commons for 30 years. In 1786, he applied for and obtained a baronetage as heir and representative of Sir George Sinclair, of Clyth, with descent to heirs male with the intervention of females; a very remarkable distinction, and scarcely has a parallel.

Sir John Sinclair early enlisted under the banner of Pitt, to whom he adhered and supported in every occasion. He became a warm party politician, a zealous agriculturist, and a very active general statist. His writings were confined to letters and pamphlets on political and financial matters, which had the passing reputation that attaches to the productions. He made a journey of 7,500 miles over northern Europe, and collected much information on the condition of the northern kingdoms, and made many valuable friendships with eminent personages of the day. In 1787, he commenced rural improver on his own estates, which have ended in giving a new physiognomy to the county of Caithness. The estate comprehended 100,000 acres of neglected lands, not very rich naturally, and let in the hands of small tenants, who held in mixed lands, and huddled a cropping of it for a bare existence. He established farms of a moderate extent to suit the amounts of capital that could be obtained, and was obliged to expend his own money freely on loan or in promissory obligations of no mentioned date. The social circumstances favoured these operations, and the continued advance in the value of agricultural produce rendered successful every attempt to improve the soil. The realizations were great; a rental of £300 very soon rose above £1600, and the

moral state of the tenantry was largely improved. Cheviot sheep were introduced, and added much to the value of mutton and wool. The yearly produce of one estate was raised from £282 to £8,000, and when sold, it brought £40,000. Everywhere a rude civilization was civilized, and the country improved, without being depopulated.

The public roads did not escape notice; and Government was interested in the undertaking by the exertions of the county member. Plantations of trees were largely done, and the fisheries were provided with villages, which continue in a thriving condition to this day. Money was advanced to private persons to engage in the fishing trade, and public aid was procured for the building of harbours. The idea, or rather the necessity of a consuming population, did not escape the grasp of thought, and new towns were planned and old ones repaired. A society was established for the improvement of wool, in the Western highlands and isles, which did much good.

In 1791, the idea occurred of the statistical account of Scotland, which was done by the clergyman of each parish, and was finished in seven years. This was a Herculean task, and cost much labour and perseverance; but it amply repaid every exertion by the vast mass of information it conveyed on general statistics. In 1793, the plan was circulated for establishing a Board of Agriculture, and after some little opposition, a yearly grant of £3,000 was obtained, and a charter from the Crown, and also the privilege of franking, in order to save the enormous expense of postage in the necessary communications. The extensive and very useful labours of this Board are well known; each county in the kingdom was surveyed by competent persons, and a large and interesting correspondence was established. The communications were collected and published in volumes, which added very much to the utility of the establishment. Sir John Sinclair strongly advocated a bill of general enclosure, and partly succeeded; he wrote much on finance, taxation, and revenue. He corresponded with many eminent men over the world, and was consulted by foreign governments on agricultural subjects, to whom he ever recommended experimental farms. He continued an unceasing labour on various subjects, till his death in 1835.

The agricultural works of Sir John Sinclair are as follow:—"The statistical account of Scotland, drawn up from the communications of the ministers of the different parishes;" Edinburgh, 1790-1798, 12 vols., 8vo. "Communications to the Board of Agriculture on subjects relating to husbandry and internal improvement;" London, 1797, 4to. "Enquiry into the nature and causes of the blight, rust, and mildew;" 1800, 8vo. "General view of the

agriculture of the Northern counties and islands of Scotland." "An account of the systems of husbandry adopted in the most improved districts of Scotland; with some observations on the improvements of which they are susceptible;" Edinburgh, 1808, 8vo. "On oil as a manure." "An enquiry into the culture and use of the potato;" Code of Agriculture, 1 vol., 8vo. "Report on the subject of Shetland wool;" London, 8vo. "The agriculture of the Netherlands;" 1806, 8vo. "Account of the origin of the Board of Agriculture, and its progress during the first three years;" London, 1798, 4to.

Sir John Sinclair spent an active life, of a more than ordinary duration, in promoting the welfare of mankind. He spared no expense, no bodily labour, and no mental exertion, in order to advance the object in view, and few persons ever pursued an occupation with more ardent zeal or more persevering industry. The gigantic exertions of individual minds have ever done more to adorn, improve, and dignify the human race, than any collection of men or classes; the short space of one life does more general good than generations of regular tendency. No man ever lived who has done more for agriculture than the subject of our memoir, or in a greater variety of ways for the advancement of its knowledge. For upwards of half-a-century, the

subject was uppermost in his mind, in relation to some particular branch of its bearings; the general purpose of increasing the fertility of the earth's surface, was never slipped or allowed to be out of view. His name must ever be regarded as a great benefactor of the human race, and one whose fame is confined to no time or country. No pillar, no stone, no bust, commemorates his services; he is his own monument, which he erected by his services and exertions. This is true, but may not be just and generous.

With some very few exceptions, Sir John Sinclair was a strict politician of the anti-liberal school, and firmly believed that agriculture as an art could not live, and far less be advanced and flourished, unless protected by artificial regulations and fiscal exactions. With this propensity in himself, and a keener bias in Arthur Young, who was secretary to the Board of Agriculture, that institution became a political debating club, from which Government withdrew the yearly grant of £3,000, and consummated its overthrow. The idea is not yet extinct in the world, that one being or thing must live on the depressed condition of another. The crochets of Sir John Sinclair were not greater than of many others, whose general views were much less correct, and not nearly so profound. He often thought deeply, and generally opined well.

## THE OUT-GOING VERSUS THE IN-COMING TENANT.

BY A PRACTICAL FARMER.

I have no desire to revive a discussion on tenant-right; all that can be said upon that subject has been repeatedly brought forward during the past seven years, at nearly every gathering of agriculturists, and it has been almost forced upon the legislature; so that a landlord's and tenant's differences might be settled by law. For my part, I think tenants may make proper covenants to secure to themselves their own rights as tenants; and no prudent tenant will take a farm for any lengthened period without stipulating for an allowance for "unexhausted improvements;" indeed, he has no security otherwise for his extra outlay. No reasonable landlord could object to this; but if a landlord is to pay a compensation for all permanent improvements, whether authorised by him or not, it becomes quite another thing.

I have known cases where such has been stipulated, and the result has been very unfavourable to the landlord; so much so as to prove a bar to re-letting the farm: the demand for permanent improvements to be paid by the landlord amounting to large sums, and those to be repaid by the in-coming tenant

so heavy as to preclude re-letting, except under a fair valuation. I wish to correct this, and to see a fair and equitable system established for valuations, as between out-going and in-coming tenants, throughout the country; being anxious to protect all parties against injustice, and believing that an uniform system or order of valuation might prevail in every part of the country, as it would lead to great improvements.

Why should the in-coming tenant pay from 10s. to 12s. per acre for ploughing, when half the sum would suffice if the ploughing was performed by the best implement, and in the most economical manner? Why should he pay for bare fallows, when a good crop of turnips might have readily been obtained, and have been far more valuable to him and the land too? Why should he pay for dressings and half-dressings, of which he knows nothing, and can seldom perceive that they have been done, when the manure would have been far better in heap, to be used at pleasure, or applied in accordance with his own ideas of improved management? Why should he be called upon to pay

large sums, in accordance with "the customary mode of valuation," without in any way receiving an equivalent for his money? This is wrong. It does not accord with my ideas of an improved agriculture, or rather improved management—improved appliances—improved economy in the various applications of modern practices, having for their object the lessening of expense. And yet most of the valuations, as between "out" and "in" tenants, are based upon *custom*, instead of modern agriculture.

I have lately had two cases under my own cognizance: the one, a farm of nearly 380 acres in a northern county—the tenant-right on which did not exceed £280; the other, a farm of 92 acres in a southern county—the tenant-right of which farm was estimated by two eminent valuers, and exceeded £460. The proportions of grass and arable were much alike, and the produce in hay and straw, &c., taken at their worth, exceeded considerably that on the larger farm. It included also more than 150 acres of growing wheat, 50 acres thereof being bare-fallowed for wheat, besides the usual ploughings and cartings; whereas the smaller farm had not one acre of wheat sown, and nothing whatever done in labour beyond what was effected in the larger farm. The only difference was in a few acres (not exceeding five) of underwood uncut, and which was scarcely strong enough to make into hurdles. Now these were both valued according to the custom prevailing in these counties; the great items in the southern county being for ploughings, harrowings, rollings, dressings, and half-dressings.

Another case I might name. A respectable and industrious man in a southern county had saved £400; he thought himself rich enough to take a farm suited to his capital; one offered; valuers were appointed, and on these being presented to him, he found, to his utter astonishment, that his whole capital was sunk in the valuation. The result was, that he became an embarrassed man. This subject deserves the most serious consideration of the whole agricultural body, and, looking at its great importance, I earnestly beg the attention of the press and the public to it.

I think landlords and tenants are alike vastly interested in this question. Valuers ought no longer to adhere to, or be tied down to any custom. Much depends upon them; they, therefore, as a class, ought to ascertain the best practice of agriculture, and value in accordance with such practice, regardless of the customary mode of valuation in any particular district.

If the northern county farmer can cultivate his farm at far less cost than the southern, the sooner the latter is taught the same practice the better. I know that such a valuation would soon teach him

to look abroad:—he would speedily try economy in every way;—to draw a plough far better adapted for cultivation, his four horses would give place to two;—his bare fallows to good crops of turnips;—his grazing lands to the fattening of cattle and sheep, instead of hay;—his straw would be converted into good dung, rather than sold off, never to be replaced.

THE PROFIT OF BREEDING POULTRY.—This is a branch of agricultural economy which has been too much neglected. Its profits have been overlooked; scarcely taken into account among the items of farming revenue; but treated rather as a matter of pin-money for the wives and daughters of the farmers. Where the rearing of poultry has been seriously taken up as a business question, with a view to income and expenditure, the profits, as compared with the capital employed have been immense. We have before us the balance-sheet of a cottager, who, living by the road side, found space to keep a number of chickens and turkeys, mainly for breeding. The following is last year's return:—

PRODUCE.		£	s.	d.
53 turkeys, estimated present value 4s. each	.....	10	12	0
30 ditto, second hatch, at 1s.	.....	1	10	0
20 couples of fowls, at 2s. 6d.	.....	2	10	0
12 ditto, young, but safe, at 1s.	.....	0	12	0
Eggs	.....	0	8	0
		£15	12	0
COST.				
24 lbs. of rice, at 1½d.	.....	0	3	0
8 bushels of barley, 28s.	.....	1	8	0
8 ditto of tail wheat	.....	0	12	0
2 loads of barley raking, set down to carry old stock through winter	.....	1	10	0
		3	13	0
In favour of poultry, and to pay labour	.....	11	19	0
		£15	12	0

The trouble attending poultry-rearing is exceedingly slight, as compared with that required by other stock. They are hardy, generally healthful, if the necessary conditions of cleanliness be attended to, and to a great extent they are capable of shifting for themselves, and picking up a large portion of their own living from what, but for them, would be wasted and worthless; and if they occasionally break bounds and become trespassers, they compensate for it by the timely destruction of a myriad of insects and grubs and caterpillars, which, suffered to remain, would have done infinitely more mischief than their devourers. Both fowls and eggs, moreover, readily find a sale, at remunerative prices, throughout the year. The subject is one which deserves attention—not from amateurs alone, but from practical men, looking to adequate compensation for their labour, skill, enterprise, and outlay. The existing "mania" will naturally, in the ordinary course of things, soon die out; but the taste for poultry will survive, and an increased supply and improvement in the breed, adding delicacy and flavour to the luxury, will inevitably extend the demand, and maintain prices at a remunerative rate.—*South Eastern Gazette.*

## AGRICULTURAL STATISTICS.

One of the standing charges against the tenant-farmer has been his assumed reluctance to enter on any detail as to the nature and extent of his business. We should think such a prejudice was by this time pretty well worn out. Consider the number of pen-and-ink gentlemen that within the last few years have done him the honour to call on him. The proclaimed "commissioners" and "own reporters," that have followed one on the heels of another, all alike intent on getting at the bottom of this mysterious pursuit; and requiring board, lodging, and information with the air and confidence of a royal command. Seldom, if ever, either, were these demands refused. To the credit of the working farmers of this country let it thus be recorded. Well aware that these said commissioners too often came with anything but a friendly bias, still did they lead the way round to explain their plans and furnish their results; waiting patiently enough to be shown up, in the course of a day or two, as the very models of sloth and exploded systems. "Our own reporter" generally wrote "with a purpose," and it is but justice to add that he as generally kept it in view.

There is an opportunity now for the farmer becoming his own reporter. If it so please him, he himself may furnish those returns so really requisite for a government to have, and of so much importance to the producing classes of this kingdom. With statistics of almost every other kind at our fingers' ends, we have none either comprehensive or correct enough to be of any use in the pursuits of agriculture. We have still to depend on the well-worded report of the gentleman who "writes with a purpose." It sounds somewhat strange that it should be so, but yet so it is. One might almost suppose that the Government would have long since been alive to the advantage of having some such information at their command. The difficulty, however, of obtaining it may have stayed ministry after ministry from attempting to do so. Without the cordial co-operation of the farmer, Agricultural Statistics can be of but little reliable value; and certainly, so far, there has been but little such assistance proffered.

Plainly the subject, until a very recent period, has engaged anything but the attention it deserved. Perhaps the most important consideration ever given to it by the agricultural community was at the London Farmers' Club, so far back as the close of the year 1846. The question, as then asked by Mr. Shaw, was as to the necessity of obtaining an

accurate system of agricultural statistics. And to this there was but one answer, embodied in the following series of resolutions, proposed by that gentleman on the subject, and passed with the unanimous consent of the meeting:—

"That, in the opinion of this meeting, an accurate system of agricultural statistics would be highly beneficial:

"First, because it would show how far the British soil was capable of producing a sufficient supply of food to meet the demands of the population.

"Secondly, that it would show the annual increase in the amount of agricultural produce.

"Thirdly, that in seasons of deficient harvests it would indicate the probable amount of deficiency, and thus prevent undue speculation in foreign grain, to the injury as well of the farmer as of the importer.

"Fourthly, that it would enable both the landlord and tenant to form an opinion whether there was a growing demand, and thereby determine to make an outlay in improvements to meet it; and,

"Fifthly, that in the case of failure of crops, as of the potato crop in the last two years, the deficiency might be readily ascertained, and consequently the amount of food required to replace the deficiency more easily and promptly provided."

Still the point made but little progress. It was taken up by one or two only of the local clubs, and then gradually suffered to die away. It comes again now, however, with more promise than ever; and at least with a trial insured. In another column will be found an article from a Scotch paper, detailing the plan on which this experiment will be made in the North. Government supplies the funds, and the Highland Society arranges and directs the machinery. Here, after all, is the great difficulty. Unanimous enough as to the end to be obtained, the London Club differed almost man from man as to the means of arriving at it, and closed their discussion without recommending the adoption of any system for the collection. The Scotch method has undoubtedly been well considered, and if the farmers themselves will only act up to it, must be efficient. Of the three counties selected, Roxburgh, we are told, "is to be divided into seven districts, the county of Haddington into six districts, and the county of Sutherland into four districts. Each district will be composed of a certain number of contiguous parishes, as like as possible in their agricultural features and products.

"An 'Enumerator' has already been named for each district. In each parish of his district the Enumerator has a correspondent. This staff consists of farmers of standing and influence.

"The enumerators furnish the Secretary of the Highland Society with lists of the occupiers of land in their districts. The necessary number of schedules are to be enclosed and addressed in the Secretary's office, and sent *en masse* to the enumerators for distribution. Each packet will contain a specimen of a complete schedule in print, and a printed letter of instructions, signed by the enumerator.

"The schedule shows the occupant's name and address, the total and the arable acreage of his farm, the acreage under different crops, the acreage not under crop, and the stock. The crops enumerated are wheat, barley, oats, rye, beans and peas, vetches, turnips, potatoes, mangold, carrots, cabbage, hay, alternate grasses, improved permanent grass enclosures, irrigated meadows. Land not in crop—bare fallow, sheep walks, woods, waste. Stock—horses, milk cows, other cattle, ewes, wethers (tups are to be returned along with the wethers; where sheep form the staple of the farm, a schedule exclusively applicable to sheep is to be issued), swine.

"The schedule will be delivered to occupants by the 10th of May, and is to be completed and returned to the enumerators of the several districts on or before the 20th of that month, by which time farmers can pretty correctly estimate the extent of green crops still to be sown.

"The returns will be checked and tabulated in the office of the Highland Society, and lodged by the Secretary with the Board of Trade.

"So far the returns exhibit only acres and stock; they afford no indication of annual produce, and, indeed, contain nothing beyond what a landlord already knows. It is not intended to put any direct questions to the farmer in reference to production, nor will the enquiry in any way expose the produce of a single farm, while it is hoped that it will afford the means of correctly arriving at that of a county."

We quite agree with our northern friend, from whose columns we take these particulars, as to the safety with which the returns may be made. We believe, too, that there is every confidence as to the successful issue of the experiment; and more than this—that it will be much better done in the north than it will be in the south—where a similar trial is about to be entered on.

There is a fair challenge enough for us here, and we only trust the collection will be set about with as much spirit and earnestness as it has already been taken up there. We shall have the advantage of their plan in drawing out our own; but still, we repeat, all must depend on the co-operation afforded by the farmers themselves. We are ready to believe that they have grown out of those confined

views so naturally associated with their calling, and that they will see the necessity and benefit of having their position only fairly represented. It will be a disgrace to us, indeed, should the offer now made be not received in a manner warm enough to warrant the adoption of an annual and general return of Agricultural Statistics.

It has been suggested by the *Gardeners' Chronicle* that the experiment here should be confided to the London Farmers' Club, with which society certainly rests the merit of having first called attention to the subject. Could the general embodiment and assistance of the local clubs be depended on, there would be no better or more appropriate machinery devised than that the farmers' clubs, with the London one at their head, might supply. But unfortunately many of the district clubs have little more than a name yet remaining, and many a district has not even this sign of one attached to it. It is a question with us whether the different boards of guardians would not supply the deficiency, and furnish the most efficient enumerators and committee men. Mr. Baker of Writtle, we would observe, suggested their use at the meeting in 'forty-six, to which we have already referred.

As it is, we believe the experiment with us is confided to the Royal Agricultural Society of England, and that Norfolk and Devon are the counties selected for it. We have only to hope that they will all prove worthy of the trust placed in them. We shall watch their proceedings with an interest which is sure to be shared by the country generally.

The following from the "Edinburgh Evening Courant" gives the full particulars of the system about to be adopted by the Highland Society, and from which we have quoted above:—

"It is with much pleasure that we lay before our readers the following communication from the Board of Trade to the Highland and Agricultural Society of Scotland, announcing that the Government will defray the expense of the patriotic experiment about to be made by the society, in the collection of the agricultural statistics of the counties of Roxburgh, Haddington, and Sutherland:—

"Office of Committee of Privy Council for Trade,  
Whitehall, March 23, 1853.

"SIR,—I am directed by the Lords of the Committee of Privy Council for Trade to acquaint you, for the information of the Highland and Agricultural Society of Scotland, that their lordships have had under their attentive consideration the proposal submitted to them by the society, for collecting, in the course of the present season, the agricultural statistics of the three counties of Roxburgh, Haddington, and Sutherland, provided that the expense of doing so shall be defrayed by her Majesty's Government, and which expense the society, in the letter transmitted to my lords, by its president, the Duke of Roxburgh, on the 10th of December last, guaranteed not to

exceed a maximum of £900, at the same time that it was stated by the society that £700 would probably be found sufficient for the purpose.

"Their lordships direct me to inform you that, having obtained the necessary Treasury sanction, they are now prepared to guarantee the payment of such sum (not exceeding in any case the above-mentioned amount of nine hundred pounds) as may be found necessary in order to ensure in the three counties specified the satisfactory execution of the task which the Highland Society proposes to undertake, in the manner explained in the written communications addressed by it to this board, and in the conferences which have taken place between my lords and the society on the subject. Their lordships trust that the Highland Society will conduct the inquiry with the utmost regard to economy that is consistent with the attainment of the objects had in view.

"My lords are desirous, in conclusion, of taking this opportunity of expressing the sense entertained by them of the disinterested spirit with which a society, so distinguished for its exertions in promoting the cause of agriculture in Scotland as the Highland Society, has undertaken the responsible and laborious task of making the proposed experiment, which my lords trust may, by the success attending it, show the practicability of collecting complete and authentic returns of the agricultural statistics of the whole of Scotland.

"I am, sir, your obedient servant,

"J. Hall Maxwell, Esq."

"JAMES BOOTH.

We may add, in reference to the way in which the inquiry is to be conducted, that the county of Roxburgh is to be divided into seven districts, the county of Haddington into six districts, and the county of Sutherland into four districts. Each district will be composed of a certain number of contiguous parishes, as like as possible in their agricultural features and products.

An "Enumerator" has already been named for each district. In each parish of his district the enumerator has a correspondent. This staff consists of farmers of standing and influence.

The enumerators furnish the Secretary of the Highland Society with lists of the occupiers of land in their districts. The necessary number of schedules are to be enclosed and addressed in the Secretary's office, and sent *en masse* to the enumerators for distribution. Each packet will contain a specimen of a complete schedule in print, and a printed letter of instructions signed by the enumerator.

The schedule shows the occupant's name and address, the total and the arable acreage of his farm, the acreage under different crops, the acreage not under crop, and the stock. The crops enumerated are—wheat, barley, oats, rye, beans and peas, vetches, turnips, potatoes, mangold, carrots, cabbage, hay, alternate grasses, improved permanent grass enclosures, irrigated meadows. Land not in crop—bare fallow, sheep walks, woods, waste. Stock—horses, milk cows, other cattle, ewes, wethers (tups are to be returned along with the wethers; where sheep form the staple of the farm, a schedule exclusively applicable to sheep is to be issued), swine.

The schedule will be delivered to occupants by the 10th of May, and is to be completed and returned to the enumerators of the several districts on or before the 20th of that month, by which time farmers can pretty

correctly estimate the extent of green crops still to be sown.

The returns will be checked and tabulated in the office of the Highland Society, and lodged by the Secretary with the Board of Trade.

So far the returns exhibit only acres and stock; they afford no indication of annual produce, and, indeed, contain nothing beyond what a landlord already knows. It is not intended to put any direct questions to the farmer in reference to production, nor will the inquiry in any way expose the produce of a single farm, while it is hoped that it will afford the means of correctly arriving at that of a county.

The process will be this. The Secretary having tabulated and abstracted the returns, reports to the enumerator of a district the number of acres of each description of crop sown. The enumerator and his committee, consisting of a farmer from each parish of the district, meet immediately before harvest, and compare notes with each other as to its probable prospects; they meet again after the harvest, and determine the number of bushels of the different grains, tons of the different roots, &c., &c., which may be assumed as the fair average produce, per acre, throughout the district in question, for crop 1853. In like manner, the ewe and the wether stock, returned in May, afford the means of estimating the wool, while the yield of lambs can be correctly calculated by that portion of the ewe stock which the district committee will know to have been bred from. Finally, milch cows will enable dairy produce to be judged of.

The district averages will be reported to the Secretary, and, when put together, they will enable him to exhibit the gross produce of a county.

It is gratifying to be able to state that there is every prospect of this important experiment being successfully conducted in Scotland. The farmers have responded to the appeal of the Highland Society in a manner which reflects the highest credit on their enlightened views and public spirit. We believe, indeed, that the Secretary has had no difficulty in completing his staff in the different counties from among farmers whose names are a sufficient guarantee for the success of the inquiry. Such a result is the more to be desired, as we observe, from the English newspapers, that a similar experiment is to be instituted in certain counties of England. We know not what machinery is there to be put in operation, but we confidently believe that it will not prove more efficient than that of which the Highland Society has been enabled to avail itself.

WOOL AT THE RIVER PLATE.—Since leaving Buenos Ayres my way has been through sheep-farms. Indeed, the whole country, taking that city as a centre, and describing a semi-circle with a radius of thirty leagues, is one vast sheep-walk. Experience has proved that sheep-farming is an extremely profitable occupation; and, as soon as the population is sufficiently increased, the quantity of wool that will be shipped from the River Plate must produce a very sensible effect upon the prices in Europe.—MacCann's Argentine Provinces.



## ON THE PERMANENT IMPROVEMENT AND MANAGEMENT OF INFERIOR GRASS LAND.

When we cast the eye across the different provinces of the United Kingdom, and compare the quantity of land under aration with the quantity of land under permanent pasture or grass and in a natural state, and when we take into consideration the vast extent of grass lands lying in a state of wildness, so to speak, unfit for either rearing or feeding oxen or sheep with profit, when we further consider how much could be done in the way of permanent improvements by means of draining, subsoiling, and manuring, we are driven to the necessity of lamenting the little progress which art has made in the amelioration of the British soil. To expect agricultural prosperity under such a state of things is hopeless indeed; for the produce of lands lying in such a state cannot enter into competition with the produce of the grass lands of the continent of Europe and the boundless prairies of America, which finds its way into the British market almost with equal facility and cheapness.

The reason why so much of the country is lying in this comparatively wild state, occupied by ant-hills, rushes, and a long list of inferior plants, is of a three-fold character. In the first place, the modern system of furrow-draining—the only mode of draining capable of conquering such soils—together with subsoiling and artificial manuring, is only of very recent date; and prior to the introduction of this new system, the cultivation of such lands left but little profit to the farmer. In the second place, the little profit which such lands did yield was consumed by the tithe proctor; and in the third place, the better description of arable lands yielded a sufficiency almost of bread corn without the lands in question. During the last century, for instance, although there was always less or more corn annually imported, there was at the same time a bounty paid on exported corn, with a counter balancing exportation from first to last, nearly equal to the imports. The population of Great Britain at the commencement of the present century was only about 10,000,000, while in 1850 it was 21,000,000, or about double; hence the difference of the daily wants of the two periods, and the claims which these have on the British soil for bread. Up to a recent period, again grumbling at the ravages of the tithe proctor was the common theme of every province of England, checking the progress of improvement as the winter frosts check the progress of vegetation. But tithes are now commuted, leaving the agricultural mind free to expand, as it were, like the vegetable kingdom under the propitious influence of spring; while chemistry and mechanics have effected an entire revolution within the last few years in the mode of cultivation. Changes so great demand a corresponding change in the permanent improvement of the country, and the management of the grass lands in question.

Such being the state of the country, the best plan of breaking up inferior grass lands to aration, becomes a

very important practical question—one on which we shall offer a few observations very briefly.

As in all other cases, details in practice will very much depend upon soil, climate, and similar circumstances; yet, a general sort of theory may be enunciated in drainage, aration, and manuring. In the generality of cases, for instance, grass lands of the description in question contain an excess of water during winter, while they are subject to scorching by drought during summer. Sometimes, they are soaked in water all the year over, either from springs or capillary action. Hence efficient drainage is the first step to be taken in the permanent improvement of such soils. Such soils, again, are generally in a sour or acidulous and consolidated state, not only excluding the free circulation of the atmosphere so essential to the health of plants, but also preventing their roots from spreading in search of food, while that food is impregnated with poisonous matter. Hence deep cultivation, or the proper loosening of the soil, is the second step to be taken in the permanent improvement of it. The last division of such a theory involves the conversion of the vegetable matter which such a soil contains into the food of the cultivated plant; such as corn and green crops the produce of aration; and such a soil not unfrequently contains a very large amount of vegetable matter, of a woody and coarse character, by no means easily reduced to manure. Hence the reduction to practice of the latter proposition is often the most difficult of the three—one which gives rise to a greater amount of speculation than either of the former two, not excepting drainage itself, on which so much has been said and written.

Inattention to facts—or perhaps, more strictly speaking, an oversight of the nature of facts of the simplest kind, together with the use of ambiguous phraseology, has given rise to much of that diversity of opinion which has been publicly manifested on the subject of draining. For instance, how often do we hear the advocates of deep and shallow draining, in their controversies, argue—the former that deep drains draw better than shallow ones, and therefore admit of being placed farther asunder; an argument which is met by a flat contradiction as to fact by their opponents, for, say they, drains four feet deep will not draw at all in some stiff, tenacious soils, more especially in moist climates. Now, in this example, parties overlook the fact that the points at issue are settled ones long ago in the science of hydraulics. In both cases, for instance, the depth of the drain is the diameter of the draining pipes, supposing such to be used; and the pores of the soil which surround them may be considered tributaries to the same, so that the disputed depth of the drain, or depth of soil above the pipes, forms part of the length of the drain, being part of the distance which the water has to flow. Now, it not unfrequently occurs that both parties are draining

with pipes of equal diameter; hence, it might be asked, about what do they differ? Again, the expression, "drawing," or "sucking," is an erroneous one; for it is a well-known fact in science that sucking-in water or any other fluid is the creation of a vacuum, into which such fluid flows by the laws of atmospheric pressure, of which the common pump furnishes a familiar example. Now, pipes are not in a state of vacuity; hence the fallacy of the expression. The simple fact is, that water percolates through the soil into the pipe by gravitation; so that the question at issue is—whether will most water percolate through a soil four feet in depth or through a soil two-and-a-half feet in depth? "Whether will a thick skin or a thin defend the best?"—a question settled long ago in favour of shallow drains; for experiments have proved a thousand times over that short pipes discharge more water than long ones, other things being equal. It may now be said that other things are not equal—that the greater depth of soil above the drains will communicate a greater pressure, and hence discharge; but such an objection not only supposes an imperfect state of drainage, from the pipes being too small, but also a state of things not existing in practice; for if the pipe discharges the whole of the water at the bottom of the field or outlet into the main drain, it is obvious no such pressure as that contemplated can take place towards the upper portion of the field, where the pipe can only be about half full, and even less than that above the middle of the field.

The depth at which drains should be placed in the soil should depend upon its porosity; and in tenacious clay soils, usually termed impervious, upon the depth to which they are cracked or rent in fissures by the sun in summer. And the distance between drains will be regulated by similar data. Soils will only admit a certain quantity of water through them in a given time, and the distance between drains ought always to be such as to allow the greatest flood to percolate freely into them; hence the distance between becomes one of those practical questions which should always be settled by experiment: no one should trust such an important practical question to mere opinion. Generally speaking, drains are placed too far asunder, so that during the winter months water stagnates in the soil, and not unfrequently may be seen in a rainy day flowing in the furrows. Hence the advantages of proper drainage are unknown in such cases. Were parties to be guided by experiments, as we propose, instead of mere theoretical—often conflicting—opinions, losses of this kind would be avoided.

The fallacy of the two arbitrary depths of  $2\frac{1}{2}$  feet and 4 feet advanced by the shallow and deep draining systems, may be thus briefly exposed. If, for instance, water will only percolate  $2\frac{1}{2}$  feet perpendicularly, by what law of matter do we arrive at the conclusion that it will percolate horizontally some 9 or 10 feet? and *vice versa*, if it will percolate horizontally 9 feet, what is to prevent it from percolating perpendicularly 4 feet? Again, all soils become more dense and compact the deeper we dig in them, and hence will discharge less water through a given area to the drains the deeper the pipes are placed; hence the greater the depth at which drains are placed, the less should be the distance

between them—a conclusion which will be corroborated by experiments as suggested, however opposed to the fire-side notions of many it may be; for a narrow pipe and a long pipe will never discharge so much water as a wider and shorter one. In short, the soundness of the conclusion is already a settled question in hydraulics.

The proper drainage of clayey soils can never be effected unless they are subsoiled, or loosened to a considerable depth below the plough furrow; and even soils which are not clayey require subsoiling, in order to break various incrustations or pans between the soil and subsoil, so as to allow the roots of plants to descend in search of food without injury. Old grass-lands of an inferior kind not only require loosening, to allow the free percolation of the water to the drains, and the roots of plants to descend in search of food; but also for the purpose of allowing a free circulation of the atmosphere to support vegetation, and the washing out of the soil poisonous salts. When such lands are first broken up, they have not unfrequently a bluish colour and a sour smell, in consequence of the presence of such salts; but if properly drained, subsoiled, and manured, they soon assume a healthy, rich, and mellow appearance. It is often wonderful what the effect of a single season will produce. After draining, trenching, and liming, we have seen very blue shale clays become rich mellow loams in one season; and a bluish clayey gravel incumbent on shale and wacke, full of the roots of aquatic plants, yielding pasture not worth more than five shillings per acre, converted into a rich black garden-like mould, yielding from thirty to forty tons of turnips, and about seventeen tons of potatoes. The example was in Ireland, where climate is no doubt singularly favourable to both these crops; still the effect produced was the same. In England we have had similar examples on the cold Oxford clay soils of Huntingdonshire; only in the latter examples lime was not used. In short, whatever be the nature of the soil, plants will not luxuriate in it unless it be of considerable depth.

Old inferior grass-lands are generally covered with a coarse sward, composed of the roots of plants difficult to rot, so as to support vegetation when newly ploughed; hence the various plans adopted in practice so as to obviate the difficulties here experienced, such as paring and burning, various modes of trenching, the lazy-bed system of Ireland, &c., &c.

The former of these, viz., paring and burning, is perhaps the most common method, but by no means the best on that account; for, as was stated in a former number in reply to Quæstor, it involves the theory of burning the stackyard for the sake of the ashes. Were it possible to make charcoal in the open air, the theory would be a plausible one; but this being absolutely impossible, the result is very opposite. We stated formerly that we burnt more vegetable matter in one season in paring and burning, in the county of Huntingdon, than the stackyard contained after harvest many times over. Part of one field was carted into a large compost-heap, and when rotted made rich compost; and we often wished afterwards that we had tried the experiment of mixing the sods collected from the paring-plough with urine, guano, lime, &c., and applied the different com-

posts in competition with the burnt ashes, and on the pared soil after trenching and after subsoiling. One great objection to paring and burning is that the work can only be performed at a season of the year too late, often, to get the lands properly prepared for either corn or green crops; but the plan of collecting the sods and rotting them in compost hills on the field, would allow the paring-plough to be yoked during the early part of the winter season, and the lands turned up to the pulverising influence of the weather; than which nothing is of more importance to soils of the kind in question, generally speaking. If subjected to such a course, and the compost applied in seed time, there cannot be a doubt but that very heavy crops of turnips, potatoes, or the like, would be realized. We once broke up a small piece of old grass ground in squaring off a field—a light friable gravel, so unpromising that we did not think it worth the ploughing for oats the previous year. Rolling, harrowing, and grubbing, brought the whole of the sward to the surface. As the drills were being opened, the small sods were raked into the bottom of them; a little farm-yard manure was then put over the sods, the whole covered in and sown, and the extra crop of turnips was worth more than the corn crop of the adjoining lands the previous year.

Turnips require a deep, sweet soil, and never do well after paring and burning sour tenacious clayey soils of any kind. Rape and the like are the only green crops which can be successfully grown in such cases. When oats are sown, the straw is bulky, but corn deficient; and we always found land that had been pared and burnt sooner exhausted than when otherwise treated.

The coarse, woody sward may be rotted by trenching; a work which may be performed in various ways, and which has this advantage over either paring and burning, or ploughing—that it loosens the subsoil at the

same time, and effects the most perfect state of drainage. This work may be performed by two ploughs, the one following the other; and it should always be performed at as early a period of winter as possible, so as to gain the full effect of the weather. It is, however, more commonly performed by the spade. The sward may be turned to the bottom of the trench, and a thin spit of the subsoil thrown on the top of it. This is the more common way. But we have turned over the bottom spit, and then turned the top spit of the next trench on it; and we have also placed the top spit in the bottom of the trench, with the green sward uppermost, thrown over the grassy sward a little farm-yard manure, planted sets of potatoes, and then placed the bottom spit on the top of the whole with great success. Instead of farm-yard manure, guano, or other artificial manure, may be used with equal success. If the subsoil is a tenacious clay, beans and peas may be dibbled in; and when the work has been performed at an early season, the potato sets will also have to be dibbled. Turnips may also be sown; but we were always as successful with this crop by turning the sward to the bottom of the trench—a plan which has this advantage, that it effects the highest degree of drainage, and washing of any injurious salts which the soil may contain from it during winter. Peaty subsoils—such as those mentioned by "Quæstor"—if sound, might be very profitably placed over the sward, as above stated for potatoes. The great objection to trenching is the turning up of unsound subsoils; but evils of this kind are of much less magnitude than is generally supposed, and may be got over by chemical means very easily. We shall return, on an early day, to this important topic a little more in detail, treating the several heads separately, meantime shall be glad to hear from our readers the result of their experience, or any observation they have to make. B.

## LONDON FARMER'S CLUB.

### "THE CONSTRUCTION OF FARM BUILDINGS, THE BEST MODE OF HOUSING AND FEEDING CATTLE, AND THE PREVENTION OF WASTE IN MANURE."

The usual monthly meeting took place on Monday, April 4, at the Club House, Blackfriars, Mr. Trethewy in the Chair. Subject for discussion—"The construction of farm buildings, the best mode of housing and feeding cattle, and the prevention of waste in manure."

The CHAIRMAN said he was very glad that there was about to be introduced such an important subject as the building of new homesteads. That subject was originally fixed to be introduced by Mr. Bradshaw, of Knowle, Cranley, Guildford; but that gentleman being precluded from attending by a severe domestic affliction, Mr. Cheffins had been kind enough to come forward at a very short notice, and he had no doubt that he would treat it in an excellent manner. Certainly, if they might judge from the appearance of the models which stood before them—referring to some models on the table—a very

interesting discussion might be anticipated. Before sitting down, he wished to observe, in compliance with the wish of the Secretary, that at the request of Mr. Ransome an alteration had been made in the arrangements for May and June; Mr. Ransome's request having been kindly acceded to by Mr. Hobbs. It was originally arranged that Mr. Ransome should introduce, on the 2nd of May, the subject of "The comparative advantages of the application of fixed and portable steam-engines to agricultural purposes;" and that Mr. Hobbs should, on the 6th of June, bring forward the subject of the difficulties which attend the transfer of land. It was now determined that the order should be reversed; Mr. Hobbs would introduce his subject on the 2nd of May, and Mr. Ransome would succeed Mr. Hobbs on the 6th of June, each gentleman taking his respective topic.

Mr. CHEFFINS then rose, and said—Our chairman has explained to you the circumstances which have rendered it necessary for me to occupy Mr. Bradshaw's place to open the discussion of this evening; and I need therefore say nothing more on that point, except to beg your favourable consideration while I endeavour in the best way I can to set before you Mr. B.'s views and opinions on the construction of farm buildings, in doing which I shall be greatly assisted by referring you to this plan of his new homestead, which I am about to describe to you to-night. It is at all times sufficiently a task to stand up before this club to maintain any principles or opinions, however strongly one may feel them; but the difficulty is much increased when, as in my case, I am but the mouthpiece or exponent of the opinions and principles of another. I have cheerfully accepted the task of explaining Mr. B.'s plan, not only to oblige him and the committee, but because I think it really worth the attention of the club; and again bespeaking your indulgence, I will proceed at once to the duty I have undertaken. In asking your attention to the subject which has been placed upon the card for discussion to-night, I feel that I ought in the outset to state, most distinctly, that it is not sought to claim for the plan I am about to explain to you the merit of much novelty or originality. This plan, and the homestead it correctly prefigures, are but the practical embodiment of those improved forms and modes of construction which have for some years past been before the public, and which have been (twice, I believe) submitted to the members of this club in their monthly discussions—once, in a general form, by myself in 1845, and more recently, in a special discussion on covered homesteads, by my friend Mr. Beadel, in 1851. And while it includes, not the most new, but the most useful improvements in construction, it has distinct and marked reference to those important advances in this great era of farming economy, towards which science, developed by practice and endorsed by experience, is daily leading the thoughtful and observant agriculturist. This plan is essentially practical; it is not the production of some good-natured theorist, whose philanthropy in holding out his lamp to enlighten the world-behind farmer we ought at least to acknowledge, if we do not sufficiently value it; it is not even the production of a professional man—it is a simple practical adaptation of the best and most popular improvements in farm architecture, which in this case have been brought to bear in the enlargement and remodelling of an existing homestead. Mr. Bradshaw is his own architect, and will be his own clerk of works and contractor; and this statement will, I think, give additional interest to the following description of his plan. Perhaps I may as well here give a slight sketch of the property on which this plan is about to be carried out. Knowle is an estate of about 600 acres, of which about 150 are park and pasture, 50 acres in pleasure grounds and woods, and about 400 acres arable; it is mixed loam and clay, and is good wheat and turnip land, and the whole of it has been thoroughly drained, some three feet deep,

some six feet, but the greater part about four feet six inches deep. The residence and park are towards the north end, and there are three sets of farm buildings—two of which Mr. Bradshaw is about to remove to the site of the third, and there construct out of the old materials of the whole, the homestead as shown on the plan, which will be well placed nearly in the centre of the arable land. The plan consists, generally, of three yards, which are enclosed and divided by the different buildings. It occupies a space of about 330 feet by rather more than 100 feet. In describing a farm yard, it has been usual to begin with the barn, but this building is not now so prominently important as it used to be; however, for custom's sake, we will commence with it here. The barn in this plan is 80 feet long by 20 feet wide. It is two stories in height; the upper one being the threshing floor, on which will be placed the threshing machine, the chaff-cutter, the corn and bean mill, and other mechanical appliances, to be driven by an eight-horse power steam-engine, which will be placed in a convenient position to supply all the motive power required for the different operations in the farm homestead. An eight-horse engine, with suitable boiler, will work up to 12-horses if required. The lower part of the barn will be used in preparing the food for the horses, bullocks, and pigs, for which purpose the spare steam will be employed when the engine is at rest. A granary will adjoin the barn, on a level with the upper floor, and the space beneath it will contain coals for the engine and a place for small stores. Right and left of the threshing floor, but on the level of the ground, are two smaller barns, each 30 by 20 feet, one for wheat straw and the other for barley and oat straw, both of which will communicate with the cattle sheds, the stables, and the piggeries and stock yards. The upper floor of the barn and part of the lower floor will be filled with the first wheat that is carted in harvest, which will be at once threshed out, and the space again occupied with that produce which will be most required for the stock in winter. The remaining corn will be brought to the barn from the rickyard in trucks, on a tramway, without the necessity of horse labour; and the roof of the barn will be extended over the tramway, to afford shelter for two waggons, loaded with corn, either for the stack or the market. A yard for turnips and roots will adjoin the west side of the barn. It will be partly covered by a lean-to roof suspended from the barn, and a light tramway will also be laid down to convey the roots from the rick yard to the root shed, and thence to the turnip cutter in the lower part of the barn. The stables are placed opposite the barn on the north side of the central yard; each will contain seven horses, without stalls or lofts over, but in each will be an enclosure for provender, and, being of good width, the harness will hang on the walls behind the horses. The stables will be well lighted from the roof, well ventilated, and thoroughly drained. Sufficient warmth and perfect ventilation will be particularly cared for, both being so essential to the health and good condition of the horse. Between the stables, but

under the same roof, is the entrance from the waggon yard, but entirely separate from it by close gates or doors. Two ranges of buildings, each 80 feet by 18 feet, extend between the barn and stables, and enclose the central or feeding yard. Each will contain 20 or more fattening beasts or milch cows. The feeding trough (which is without divisions) will be filled from a gangway or passage in front of the beasts; water will be plentifully supplied to them, and the trough will be sluiced or washed out every morning. The animals will stand on boards, and the space behind, with the gangway and the passages outside the building, will be asphalted, with drains to the manure tank. These buildings will be entirely closed, with every provision for light and air; but I will just observe here, that the "cow shedding" (as it is termed) in the midland and northern districts is invariably open in front, with a dwarf wall or gates to keep out pigs, &c. Stalls or standings, about 5 feet 6 in. wide, each to hold two cows or beasts, are also in universal use, and I tried in vain on three or four farms, which I have lately repaired, to introduce the neckstrap and double chains, which have so long been adopted in the southern counties. We now come to the manure tank, that most important feature in modern farming, the receptacle as well as the source of nearly all the produce on a farm. It will occupy the centre of the middle yard, and will be 60 feet long, 20 feet wide, and 9 feet deep, *i. e.*, 6 feet in the ground, and three feet out. It will be bricked and cemented, or asphalted to the level of the ground. A stout kerb or brick arches will support the open flooring and pens of the piggeries, which will be covered by a light slated roof on oak or iron pillars. These pens are intended for fattening and store pigs, and their dung will drop into the tank through the spaces of the flooring. Pigeons will also be encouraged to build under the roof over the piggeries. The drains from the stables, the slaughter-house, and the beast houses will run into the tank, and the dung from the stables and cow and bullock sheds will be daily brought into and spread over it. The tank will be emptied with carts, by an inclined plane or slope at the north end, through the entrance to the waggon yard, which will be covered over with moveable planks when not in use. The yard at the north end of the homestead will be about 60 feet by 50 feet. It will be entirely enclosed by buildings, comprising, successively, a slaughter-house, nag stable, or loose box; workshops for carpenters, smiths, and wheelwrights; stowage for guano and other artificial manures; men's room, tool house and office or counting-house, with sheds for six waggons and carts, and standings for the larger implements. These sheds will be enclosed with open gates, four or five feet high, and the yard can then be used for soiling the horses in summer on green crops, if that system should be adopted. In this yard, which is intended to be the principal entrance to the homestead, the workmen will assemble in the morning to receive their orders for the day: here, also, there will be a room for their meals, when they are about home, and here their employer or his bailiff will attend to settle with

them on pay-day. The south yards are principally intended for young stock, or at times for sheep. A shed with feeding troughs is provided next the barn, close to the turnip-cutter and steaming-house, and under the shed at the east end will be six piggeries for breeding sows; these will be sunk from 18 inches to 2 feet into the ground, for making the manure on a modified box system. Accommodation is also here provided for a bull, and an enclosed yard, in which is the engine-house, connects this shed and these yards with the straw-barn. The rick-yard will be on the west side of the buildings, and will adjoin the two principal roads on the farm. It will be open to the south, and be well sheltered by trees on the north and west. The corn stacks will be long and narrow, and, with the root clamps, will be arranged with reference to the tramways, so that they may be removed to the barn and the turnip house with as little labour as possible. I have already mentioned that this homestead will be built of old materials: it is obvious, therefore, that I need not say much about its construction, except, generally, that the several buildings will be of brick, and tiled or slated; they will be lofty and unusually roomy, for both space and material in this case are almost unlimited. All eaves water will be conveyed to drains or the adjoining pond, from whence the steam-engine will fill a large cistern or tank, placed sufficiently high in the wheat-straw barn to supply water at will to every part of the premises. I am not much acquainted with the systems of farming and feeding which Mr. Bradshaw at present pursues, or those he intends to adopt on his new homestead, and I have not thought it necessary to inquire much about them. I have this morning, however, received a letter from Mr. Bradshaw, containing some information on these points, which I will presently read to you. My attention has been chiefly directed to the buildings, and, on carefully considering their capabilities and arrangements, I am convinced that any of the distinct systems or modes of farming which have been so warmly insisted upon by their respective advocates may be thoroughly and efficiently carried out on these premises, for most of the prominent features in the best known systems will be found here, or may be introduced without inconvenience; and I think a very few words will serve to show that these premises include every element necessary for a complete farm establishment. We have an elevated site, a sheltered aspect, good roads, and plenty of water. The buildings are divided into three distinct portions: to the northern yard are confined all the operations connected with the actual cultivation of the land and the general management of the farm; the central yard and buildings may be termed the manufactory of beef and pork; and in the capacious manure tank we see the spring and source of future crops. The threshing-floor and barn-kitchen (a most appropriate and significant term), by the active agency of steam, provide for the due preparation of all the produce of the farm—each sort to its separate use, either for market or stock-feeding; while the southern yards are, as it were, a nursery for rearing and

bringing forward young stock. This description, though it may seem somewhat fanciful, is at least truthful; and it points out those conveniences and accommodations which this plan contains, and which every intelligent agriculturist is glad to combine in his homestead. In the letter of Mr. Bradshaw, to which I just now referred, he says—"In presenting a set of farm buildings to a body of practical men, like the members of the Farmers' Club, I think it would be desirable to accompany it with some statement of the system intended to be carried out in cultivating the land, as on this must mainly depend the requirements of any homestead. I will therefore say a few words on the mode I mean to pursue, and leave you to use the account as you may deem proper. My rotation is a four and six-course one—viz., 80 acres swedes and turnips, 80 barley and oats, 40 red clover and 40 white ditto, with Indian rye-grass to stand two or three years; 80 wheat, 40 acres second year's seeds. Forty acres of the seeds are to be treated thus:—Late in the autumn of the second year 20 acres, or a little less, will be broken up ten inches deep for mangold, to be followed by wheat; the other twenty acres to be broken up the end of June the third year, and made a bastard fallow for wheat. You will observe, that this system gives a large amount of green food for stock. Red clover comes once in ten years, always followed by wheat; the second cut of clover is given to sheep with their turnips. Forty head of cattle, two-year-olds, will be purchased in the spring, and put on the grass land in the park until September, when they will be tied up, and drawn out about January, or disposed of when ready for the butcher; other 40 two-year-olds or two years and six months, will be purchased in the autumn, put in yards, and follow the former in the feeding stalls as they are removed. These will be ready about June; they will be fed on swedes as long as they last, and after on mangold. Great crops of mangold may be grown without farm-yard manure, drilled three feet apart, by this management: two cwt. of guano, half cwt. of nitrate of soda, the land only once ploughed before Christmas. I ought to say a word respecting the advantages of the manure tank. The urine falling into the tank gives a certain quantum of moisture, preventing fermentation. It may be carted out at any moment required: this is of great importance, my preparation for swedes being to clear my stubbles as soon after harvest as possible, to carry out my manure on the land before Christmas, and plough it in ten inches deep. In the spring I grub and harrow, but never plough again; by this means moisture is obtained in the land, a fine seed-bed is obtained, and at far less labour. A few acres of tares will be grown on the farm for feeding horses in the spring. My average swedes will be 20 tons per acre of bulbs: I have grown more. I drill 27 inches apart, and intend this year to try some 30 inches. The above remarks I have put down as they occurred to me—make what use you like of them." I have now gone through the whole of the plan, and have, as far as I have been able, fully explained every part of it. It is not, as I said before, wished to

claim for it any superiority on any one particular point. Mr. Bradshaw's chief object in bringing it under the notice of the club has been to show what a proprietor may and can do of himself, and a practical knowledge of a farmer's wants and requirements in this age of progress has enabled him to project a homestead which will be both creditable to him in its design and most profitable to him in his occupation of it. If other gentlemen should be induced from his success to follow his example, he will feel (and I am sure I shall) fully repaid for the time and attention which have been necessary to bring this subject properly before you. For myself, I beg to thank you for the patient hearing you have given me, and I shall be most ready to give any further explanation of the plan, or supply any omission in my description of it, which any gentleman present may require (applause).

Mr. Cheffins illustrated the above essay by frequent references to a plan of the new homestead on the Knowle estate, the property of Mr. Bradshaw; but the paper read will probably enable most practical farmers to comprehend the general construction, arrangement, and situation of the buildings.

A MEMBER inquired whether he was correct in supposing that the pig-sties were over the tank.

MR. CHEFFINS: Yes, with a lattice floor.

THE MEMBER: Would not that be unhealthy for the pigs?

MR. CHEFFINS said it was not so considered, and it had been adopted extensively in the neighbourhood by practical men.

MR. BAKER said all present would, he was sure, agree with him, that Mr. Cheffins had introduced the subject in a clear and lucid manner. The basis of the plan and arrangement of the buildings described to them was that which was termed by Mechi "the tank system," that was to say, boarded bottoms to the buildings, and the conveyance of the liquid manure through them to a tank, from which it would afterwards be taken and transferred to the land. Before they entered fully into a discussion on the subject, they should consider how far the system was better than any other which had been propounded to them by various persons who had endeavoured to enlighten them with regard to it. There were three modes to which the attention of farmers had of late years been particularly directed: first, the covered home-stall system; secondly, the box-feeding system, by which every animal was confined to its own peculiar portion of the building, and places were sunk in the ground to contain the manure which the animal made; and thirdly was the system combining that introduced by Mr. Mechi—the liquid-manure system. Mr. Cheffins, who had dealt with the last-mentioned system, had not given them a full description of the mode in which the manure was to be applied. There were various periods during which liquid-manure might be applied with advantage to the land. But when the ground was saturated with water, as had been the case for the last six or eight months, it was almost impossible to carry

out that system, because the soil, being full of moisture, was not capable of absorbing more even in the shape of manure; and whatever quantity might be supplied would be carried off by the rains. These considerations were very important to farmers desirous of entering on a course of improvement, and who for that purpose were adopting new methods. Now all new methods should combine not only economy and utility in the adaptation of the buildings, but economy in the application of the manure after it had been manufactured. This must always depend upon circumstances; for some farms were so situated, and produced such an abundance of straw, that it was very difficult to convert the straw into good manure at all. On the other hand, on some farms they were obliged to resort to covered buildings, or the box system, because they did not produce straw enough. Another system, which had long been pursued, and would continue to be pursued until landlords acquired spirit enough to erect buildings for the use of their tenants, was the open-yard system, which, after all, might be as well as any other, if proper shed-rooms were provided, and an efficient method adopted of conveying the superabundant water underground, so as not to have too great an amount of moisture in the yard at one time. He had always deemed it essential that farm-buildings should be so constructed that the farmer could from his residence command a view of all the premises; for if the eye of the master were not constantly upon the men and stock, things would go wrong, and his residence might as well be a mile off (Hear, hear). To accomplish this object, however, there appeared to be no provision in Mr. Cheffins's plan; and this hint might, perhaps, induce him so far to alter it as to secure this desirable end, at least to a certain extent. The next desideratum was that the farm-buildings should be so constructed as to preserve the animals from cold winds on the north, and admit the sun and air on the south. By the plan of Mr. Cheffins, the same provision was made on the north as on the south—on the west as on the east. Again, he thought it best that the waggon-lodge should have no connection with the farm-buildings. There was this objection to having it within the area of the farm-buildings: persons were constantly passing to and fro; the gates were, therefore, liable to be left unfastened, and the cattle to trespass, and injure the implements. Then, with regard to the tank, and the liquid system—

**Mr. CHEFFINS:** Mr. Bradshaw did not intend to follow the liquid system in any way; he was quite certain that he would have straw and manure enough without doing so.

**Mr. BAKER:** Then the straw must be put into the tank.

**Mr. CHEFFINS:** In the shape of dung.

**Mr. BAKER:** If the manures were made in the ordinary way, of course they would be carted in the ordinary way. He could not see the policy of putting the piggery over the tank; that he thought was a great objection,

At all times a great deal of effluvia arose from decomposing manure; besides, pigs required warmth as well as cleanliness, and here there would be an admission of air under them, which must prove injurious. As to carting out the manure from the tank from time to time, to prevent fermentation, that was the very opposite of the course which should be followed; for it was said that until ammonia was engendered in manure the application of the manure to the land was less beneficial than it would otherwise be. Consequently, if one tank were made to receive the deposits of the cattle, another should be constructed to which those deposits might from time to time be removed, and in which they might ferment and become fit to be applied to the land. He believed that the covered yard system had every advantage in respect of enabling them to produce the largest quantity of farm-yard manure at the least possible expense; but then it must be well constructed, and sufficient regard must be paid to ventilation—a matter which, by-the-by, was not often attended to. All the covered yards he had yet seen—with the single exception, perhaps, of Mr. Cook's, of Semer—were defective in this respect. In the case of one covered yard which he had inspected, he was told by the men that the bullocks did not go on as well as in the old open yard; they seemed not to feed as well as previously, and this was attributed to the circumstance of the animals being kept so very close. That yard was of excellent construction, but it was entirely covered in, and there were only a few apertures made in the tiles for the air to escape; consequently there was not that free circulation of air which the animals required. Then, also, the dung accumulated had entered into fermentation, and a large amount of ammonia, for which there was no sufficient escape, was generated under the animals' noses. This objection applied with equal force to covered boxes where there was not a good supply of fresh air. For his part, then, he thought if there were abundant sheds about a yard, of sufficient dimensions to allow of oxen being stalled therein, or of the animals sheltering themselves in inclement weather, animals would do just as well in an open yard as in any other. And if such a yard were so constructed as to preserve all the animal deposits, and to convey away the rain so that no part of the deposits would be washed by it from the yard, nothing would be lost. True, the manure would not be so highly concentrated—true, it would be diluted; but to counterbalance this they would have three loads instead of two.

**Mr. HOBBS** (who produced the model of a covered homestead, which is now in extensive use on the estate of Lord Somers—this model having been forwarded to him by Mr. Oakley, his lordship's agent) said—He had seen covered homesteads in other parts of the kingdom, but never any so economically and successfully carried out as this, for which Mr. Oakley admitted that he was much indebted to that able architect, Mr. Day, of Worcester. He (Mr. Hobbs) could not state its exact cost, but it was in preparation to come before the country through the *Journal of the Royal Agricultural Society of England*; and he

believed it would then be shown that landlords might erect a covered homestall of this description at from 10 to 12 per cent. less than they could erect premises of the ordinary character, in which the old system of having a number of party walls was carried out. He had watched the effects of the plan on Lord Somers' estate for the last 12 months. When he first went down he believed there were only six covered homestalls on the estate, and then the general complaint among the tenants was that the buildings were too cold on account of the draughts of air. But this year he found that in the openings to the south, which were formerly gates, sliding doors had been introduced, by which they were enabled to regulate the temperature at discretion; and he thought that now, in respect of the regulation of the temperature, and the prevention of waste in manure, the objects most desirable in farm buildings were fully carried out by this covered homestall. There was one point, however, in which he thought it was defective. He agreed with Mr. Baker that the premises should be so situated that the master could command a view of them from his own residence. But by this plan the granary was in a different position from that in which he would like to see it; though this, he believed, might be easily altered. One important feature in the plan was, that there was abundance of room for corn to be stacked, and which might afterwards be used as straw-barns. It was necessary that the cost of farm-buildings should be reduced as much as possible; and this plan was, in his opinion, calculated to effect that object. It did not involve the expense of liquid manure-tanks, the system adopted being to cut the straw for litter from four to six inches in length, which, upon being strewed about, absorbed the liquid, and thus a great saving was made in carting the dung.

A MEMBER: There is no steam-engine.

MR. HOBBS: No, but there is a place for one. The plan has been very much approved of both by architects and practical farmers.

THE CHAIRMAN: What were the walls composed of?

MR. HOBBS: Of brick; the roofs tiled or slated.

MR. JACKSON then explained the model of a covered homestead on a dairy farm in his occupation in Cheshire, in which provision was made for 96 milch cows, 2 bulls, a cart stable, and a nag stable. The arrangements appeared very simple, which Mr. Jackson observed was their chief merit. The cost was stated by Mr. Jackson to be less than that of any other plan with which he had compared it.

MR. NESBIT, for the prevention of waste in manure, advocated the system of making compost heaps of alternate layers of calcareous marl and farm-yard dung. If these, he said, were turned over every three months, decomposition would ensue; the ammonia given out by the manure would act upon the carbonate of lime, and thus would be formed nitrate of lime, which was quite as valuable an agent in manure as nitrate of soda. For the purpose of obtaining an equable temperature in the covered homestead, and preventing too much cold in

winter and too much heat in summer, he recommended thatching underneath the roof; while he condemned the system of ventilation by draughts. Whatever might be said in favour of high walls for farm buildings, he must say one word on behalf of the primitive structures made of a few sticks thatched with straw, six or eight inches in thickness, and lined with sedge or hop bines. The advantage of such an arrangement was, that it allowed the wind to penetrate by a thousand interstices instead of one. There was coolness in summer, and warmth in winter; and ventilation was carried on without any draught.

MR. BAKER thought the great objection to both slates and tiles was their too great heat in summer and their excessive coolness in winter. This evil he had remedied to a certain extent, and at a small expense, by strongly pugging the pantiles.

MR. HOBBS remarked that, practically, the homestalls erected on Lord Somers's estate had answered well in every respect. The advantages were several. They were economical; they were the best preservative of manure; and, above all, the temperature of the air could be so regulated, that the cattle would not require so much food, while at the same time they fattened faster than by any other method. The interior could be adapted alike to summer and winter feeding; and they might bring in a hundred calves or beasts, and let them run together in one yard, if they pleased, or, if they preferred it, have them placed in separate boxes.

MR. PAINE, of Hampshire, said he was of opinion that, if farm-buildings were properly spouted round, for the purpose of carrying off the rain, there would be no necessity, taking the country in general, for covering in the yards. On farms where little straw was produced, the system of covering might possibly be advantageous; but in his own county he had often seen a machine employed in thrashing wheat for three or four days, and even a week, together, the farm-yard being knee-deep in straw. If the system of covered yards existed there, a considerable period would, he apprehended, elapse before that straw was converted into manure. He concurred in Mr. Baker's remarks with regard to pigsties. The drier and cleaner pigs were kept, the better; but if they sank a hole under the sty and allowed the manure to accumulate there, though they might keep the sow, they would, he feared, soon lose the pigs. His objection to the plan shown by Mr. Hobbs was, that it represented one continued shed from end to end. If an infectious disease broke out among the cattle under such circumstances, serious inconvenience and loss might be expected to ensue. Such a disease as the influenza in one of these covered yards, with five or six hundred head of cattle in it, would spread much more rapidly than where the sheds were divided by party walls. The plan which had been suggested, of putting something under the slates or tiles, was no doubt attended with great advantage. Nearly the whole of the buildings on one of his farms were slated, and very often in summer the slates were hot enough on the



inside to blister the hand. On such occasions he had seen the cattle so exhausted that the men were obliged to turn them into the open air. He thought, therefore, that if the rafters were lathed on the inside as well as next the slates, and thatched between, it would keep out the heat in summer and the cold in winter more effectually, perhaps, than the method of pugging suggested by Mr. Baker.

Mr. BAKER had tried that system; but was obliged to take off the thatch, on account of the rats getting into it.

Mr. SHEARER said that, at the Bishopstoke new cheese market, they first placed a set of laths under the rafters, then laid thereon a thick coat of well-drawn straw, nailing on the top of the rafters other laths, and slating upon them in the usual way. In the building so covered in, the cheeses were preserved in capital condition; and the roofing was found to answer admirably.

Mr. AICHESON admitted that, if they wanted a very neat farm-stead, they must have something like the model of that which had been adopted on the estate of Earl Somers, and the model of which they then had before them upon the table. But he, for his part, felt obliged to Mr. Nesbit for having pointed out to them a method by which they could introduce a cheaper system, and erect buildings where the ventilation would be as good, and the beasts would do better than in the close buildings of which they had heard so much. He (Mr. A.) had himself tested the advantages of a similar plan to that described by Mr. Nesbit, in Sussex, having constructed buildings, the sides of which were composed of eight-foot faggots closely placed together, and well secured with clay, and the tiles lined in a manner not dissimilar to the plan mentioned by Mr. Sherer as having been adopted at the Bishopstoke cheese fair.

Mr. HOBBS would be glad to know if any gentleman present, who had buildings with roofs of that description on his farm, had been able to insure them against fire. Should incendiarism increase as it had done of late, he believed that, in the course of a few years, no office in the kingdom would insure thatched buildings. He could not for one moment allow the faggot and clay wall to compete with the plan he had recommended.

Mr. PARSON expressed himself disappointed at the paucity of the information elicited during the present discussion. As to Mr. Bradshaw's farm, he knew it well. That gentleman himself was a second Mechi. He came to the fair, and talked much of his improvements, but was never able to produce his accounts, and show the balance of profit or loss resulting from his system.

Mr. SPEARING, with reference to the observations of Mr. Hobbs, as to insurance, said, that if existing companies refused to insure thatched buildings, the farmers themselves ought to establish a fire insurance of their own.

Mr. SHEARER said he had heard it stated that a great

deal might be done for the poorer landlords and tenant farmers by the erection of temporary buildings made of iron. He was sorry to find there was no gentleman present connected with the iron trade to throw out some suggestions on that point, which he thought was one well deserving consideration (Hear, hear).

Mr. CHEFFINS, in reply, said he was not responsible for Mr. Bradshaw's plan, or for its defects or advantages. All that he had undertaken was to explain the details of the plan, not to advocate it, though he could do so most sincerely. Nor did he feel himself called upon to notice the personal reflections on Mr. Bradshaw which had been made, as that gentleman was quite competent to defend himself, and would no doubt find a fitting opportunity to do so. Mr. Baker had objected to the tank, that it did not provide for the transmission of the liquid manure. The answer to that was, that Mr. Bradshaw did not intend to use manure in a liquid form, but proposed to cart it out in a solid state from the tank. He quite concurred in the necessity of the premises being so arranged that the farmer could have them all under his eye; and whenever it was practicable, either in alterations or a new homestead, it was a principle he carefully carried out. He admitted that Mr. Bradshaw's plan did not possess this advantage; but the one exhibited by Mr. Hobbs, and that produced by Mr. Jackson, were equally deficient in this respect: indeed where the systems of covered homestalls or box-feeding were introduced on any large scale, it was almost impossible to effect that object. Notwithstanding Mr. Baker's objection, he could assure him that the sun would have full command of the buildings on the southern and western sides, while the north and east winds would be shut out by plantations and a row of fine elms.

A vote of thanks having been passed to Mr. Cheffins for the paper he had read, it was moved and seconded—“That after the variety of systems advocated this evening, the club will not undertake to recommend any one in particular; the great point being to adapt the buildings to the occupation they may be erected on—soil, climate, and situation being carefully considered.” The resolution was agreed to, and the discussion terminated.

## CHICORY.

We observe some doubts are still expressed as to the intention of the Government with regard to the sale of coffee and chicory. After the publication of the late Treasury minute there ought to be none. The worst part, perhaps, of the former regulations was, that they were not acted upon by the Government; and it is, therefore, less a matter of surprise that people should entertain a doubt if the last minute will be enforced. But any doubt on this head, which we observe still exists, should be at an end after the explanation which recently took place in the House of Commons. Mr. Hastie put the following question to the Chancellor of the Exchequer:—

“If it is to be clearly understood, under the terms of the late Treasury minute, relating to the sale of coffee and chicory, that it will be considered a breach of the law to sell coffee

without any label of description, except in a pure and unmixed state; and that, if coffee so sold without being labelled shall prove to be mixed with chicory, or, whether labelled or not, shall prove to be mixed with any other extraneous substance, the party selling it will be liable to prosecution; and, if in case of information being laid of a breach of the law, the proper authorities will prosecute the offenders?"

To this Mr. Gladstone replied in distinct terms:—1. That it will be a breach of the law to sell coffee without any label,

*except in a pure state*; 2, that if coffee so sold, without being labelled, shall prove to be mixed with chicory, or whether labelled or not, shall prove to be mixed with any other extraneous substance, the party selling it will be liable to prosecution; and 3, that in case of information being laid of a breach of the law, the authorities will prosecute the offenders.

We understand that strict instructions have been given to enforce the regulations now made, with the view of interfering as little with trade as possible.—Economist.

## AGRICULTURAL AND INDUSTRIAL EDUCATION.

We said, in a former article, that the education of the farmer should be both scientific and practical, and that the two branches ought to be conducted separately. Let us now examine a little more in detail the nature of the scientific education required. In its earlier stages, it must be that given in a first-rate mathematical and commercial school, combined with something more. It should comprise arithmetic, geometry, algebra, trigonometry, and conic sections, and their application to book-keeping and mensuration, together with instruction in the art of drawing, particularly of plan-drawing, and the acquisition of the elements of botany, chemistry, and geology. This may be considered the course of the lower school. If the education of the farmer ended there, it would be a great improvement on that which the majority of the middle classes receive at present. But it should not end there. We ought to have, and with a little energy and management we might have, in every county several of these lower schools, and one central higher school, or college, in which the students should attend lectures, and pass examinations in physics or natural philosophy. This will include mechanics, pneumatics, hydrostatics, and hydraulics. And what benefit, asks Mr. Practical, will the farmer derive from such knowledge as that? What good is there in farmers knowing more than their landlords? From mechanics, the farmer learns the true principles on which his ploughs, carts, and other machines should be constructed to economise power in the working of them: it will aid him in making a selection amidst the perplexing variety of implements which meet his eye at an agricultural exhibition. Pneumatics will instruct him in the weight and pressure of the atmosphere, and how it is affected by change of temperature. It will teach him how the column of mercury is balanced in the barometer, and that of water in the pump. It will lead him to researches in meteorology, to observations on the heat and the cold, the rain and the dew, and other atmospheric changes, which exercise such important influence on the produce

of his fields. Who is brought in contact with the works of Nature so constantly, and at so many points, as the farmer? Who has such opportunities of observing, if he had learnt how to observe? From hydrostatics and hydraulics, again, he will learn the weight and pressure of fluids at rest, and their velocities when in motion, and will escape many serious errors, in his attempts to embank his lands against the sea, or a river, or even in an undertaking apparently so simple as the straightening of a brook, or the under-draining of his fields.

Besides this, the farmer should possess some knowledge of the anatomy of the domestic animals of the farm, and some acquaintance with veterinary medicine. His horses and kine will then be rescued from the hands of the farrier and the cow-leech, who will no longer levy black mail on him for putting them to a sudden, or a lingering, death. A horse with a dislocated joint will no longer be treated for the yellows, nor dosed with a drink of which the prince of village farriers boasted, that he put into it "all the jimcracks as ever he could think of," on the principle that *some of them must do good*, and then repeated a dose of the same, in a different form, on the principle that "they two meets in the middle." Should the pupil's taste lead him to follow veterinary surgery as a profession, in preference to the cultivation of a farm, Dowell will have another son off his hands. The county college ought to have a laboratory, and there the young farmer should spend some time in the practice of chemical analysis. A small amount of this knowledge will enable him to detect adulterations in guano, and those other chemical manures which the land now swallows indiscriminately to the value of millions annually. The very existence of a provincial laboratory, and the knowledge that there are chemists among farmers, has been found sufficient, in some districts, to knock up the trade of the fraudulent manure dealer, or to banish him to others, where practice reigns "alone in her glory," and spurns the aid of science.

Skill in chemical analysis will enable the farmer to discover many cheap sources of manure now disregarded; and the study of vegetable physiology, such as it is at present, by those who will have so many opportunities of observing facts and conducting experiments, cannot fail to add to our knowledge in that department of science, and to lead to great improvements in practice, as regards the use of manures.

Chemistry is a fascinating pursuit; and it may be that the pupil will be tempted to choose it as a profession, instead of farming. So much the better. There will be another of the younger sons provided for. There will have arisen among the farming body a consulting chemist, in whom, as one of themselves, they can have confidence, and who will be able to solve many questions which those well know how to propose who have not carried their chemical studies beyond the lower school, and have learned enough of chemistry to respect instead of despising it. "I paid fifty pounds," said an assistant in a chemical laboratory, "for instruction in chemical analysis, with the intention of turning it to account as a farmer, and it was the best fifty pounds I ever laid out. It led me to give up farming, and to obtain the situation which I now fill." Perhaps another of our friend's family will quit farming, to become a manufacturer of chemical manures, and to make an honest fortune by it.

In the course of study here proposed, if we except the laboratory practice, and the veterinary surgery, there is nothing which is not mastered by every boy before he enters the office of a civil engineer, and by every cadet at Woolwich or Addiscombe, before he receives a commission in the artillery and engineers, and goes to the field, that he may add practice to his science in the art of war.

If we except the veterinary surgery, there is nothing in the course of instruction which is exclusively adapted to agriculture—nothing that will not be equally advantageous to the sons of manufacturers and shop-keepers. All classes, therefore, are interested in the establishment of provincial schools of practical science. Established they will be, in all districts where there is a mixed agricultural, manufacturing, mining, and commercial population. If they are not established in districts purely agricultural, it will be because the agricultural body do not desire it. Wherever they are established, we may venture to predict that the families of those farmers will get on best in the world who are most forward in availing themselves of the advantages which they will afford.

If schools and colleges of practical science be confined to the manufacturing and commercial

districts, it will be because the purely agricultural districts set their faces against them. An illustration of this repugnance to instruction in science, on the part of the agricultural body, may be drawn from North America, as described by Professor Johnston, in his notes on that country. Nowhere have greater efforts been made for the instruction of the masses of the people than in the State of New York. Free schools, common to all, are there supported partly by the State and partly by local taxation. The total amount levied for this purpose amounts to tenpence a-head on the population. Tenpence a-head on the population of the United Kingdom would produce £1,250,000 per annum. But the money is raised in America by a tax upon property. Converting this into an income-tax, it would average  $1\frac{1}{2}$  per cent.; that average being very unequally divided, and falling with greater pressure on the poor than on the rich districts, and amounting in some of the former to as much as nearly 5 per cent. An income-tax of  $1\frac{1}{2}$  per cent. in this country, levied like ours, and with our exemptions, would produce £2,400,000 annually. Such is the value attached in America to the education of the masses; and such are the sacrifices made that they may receive it free.

Let us now see what they do in America in the matter of agricultural education. American agriculture is of the rude exhausting kind formerly prevalent in this country, and on which the first inroads began to be made with us something more than a century ago.

As a natural consequence the State of New York no longer grows wheat enough for its own consumption, but derives much of its supplies from the western states. The necessity for improvements in cultivation is therefore felt, and they are beginning to be adopted. A large portion of the House of Representatives consists of farmers, and liberal grants are made to the State Agricultural Society, to be expended in premiums, public exhibitions, &c., for the encouragement of agriculture. Through this society grants of money are made to the local societies. The local societies report to the central society, which, in its turn, makes an annual report to the legislature, of their transactions and of the manner in which the public money has been expended. This report, a thick octavo volume, printed at the expense of the State, is distributed gratuitously to the extent of 16,000 copies. It is described as abounding in excellent matter, and as having diffused by its extensive circulation much valuable knowledge among the reading community, together with a taste for systematic instruction in matters relating to agriculture. One manifestation of this taste is evinced by a proposal for the establishment of an agricultural college, to be supported by the

State. When Professor Johnston was in America it had been under discussion two years, had been favourably received by committees, and was expected to pass in 1851. We believe it is still under discussion. The opponents of the measure were the farmers: all other classes in the legislature were willing to vote the public money for the improvement of the staple interest of the country. The farmers refused to accept the grant, on the ground that the knowledge proposed to be given in the school was not required, and that its application to the soil would be of doubtful benefit.

"In a country," says Professor Johnston, "where it is part of the democratic faith that every man is fitted to fill any public office, without any special instruction, and where, as a natural consequence, the quack doctor and the educated physician receive equal encouragement in their professional pursuits, we might ascribe to this general sentiment of the people the opposition of the rural classes to the special education of their sons in those branches of knowledge which throw light on the art by which they live. But the opposition of a similar kind, which has been in so many ways and on so many occasions exhibited amongst ourselves, is a proof that there is something in the habit of mind common to the cultivators on both sides of the Atlantic which makes it difficult to convince them that anything which they have been accustomed to do has been done in a wrong way; or that by any other way which you can describe the same thing could be done cheaper, sooner, better, or with more profitable results."

One objection to the plan, was that one central college did not accord with American notions of the propriety of distributing the offices and patronage of the state by rotation among its different districts. A scheme was therefore advocated, with a view of conciliating all parties, for ten or twelve smaller colleges, distributed over the different counties of the State. *Professor Johnston considers that as regards America* much might be said in favour of local colleges, in subordination to a well organized central college, provided the central establishment were first in active operation, in order to train up men qualified to direct and preside over them. In this country—where there are so much better opportunities of learning good practice than in America, and where special instruction in agriculture is not wanted so much as cheap instruction in the sciences applicable to agriculture, in common with other industrial pursuits—we are convinced that the more local schools of practical science are multiplied the better. There will be no difficulty in finding men competent to preside over them, provided the central

governing body be not composed of a clique, but shall include men of eminence in every department of the sciences which are to be taught, and in the practice to which that science is to be applied.

Although the farming interest in the legislature of New York have manifested so much repugnance to the education of their sons in the sciences bearing on agriculture, the legislature has been extremely liberal in its patronage of science, and in the expenditure of money for objects which, to popular estimation, rarely appear likely to make an equivalent utilitarian return. A patriotic feeling of the fame which accrues to their country from such works, and a rivalry between the legislatures of the different states to outdo one another in whatever relates to improvement in social progress, are considered by Professor Johnston to be the governing motives. Whatever the motives, their result has been the great work—the "Natural History of New York"—of which sixteen volumes have been published, and four more have to appear, the expense of the whole survey amounting to about £115,000. The published volumes comprise two on the botany of the state, five on its zoology, four on its geology, one on its mineralogy, one on its paleontology, and three on its agriculture.

In all grand schemes we come sooner or later to questions of finance; we shall, therefore, request our readers to assist us in forming a committee of ways and means for the establishment of local schools of practical science which shall be useful to the agricultural, as well as to other classes. This will be found, we believe, not so difficult a question as it may appear at first sight. Let the people of this wealthy country once be convinced that such institutions will be advantageous, and there will be no lack of funds. A vast amount of money is now applied, or applicable, to industrial education, which is in some degree wasted for want of being systematically employed. If directed into proper channels with more unity of plan, it might, with some addition, be able to accomplish a large portion of the work required.

In the first place we have the Government expenditure for industrial education. It is spending for this purpose in the United Kingdom no less than £38,680 per annum, exclusive of the support of the Irish colleges established by Sir Robert Peel. The items are—1. The establishment in Jernynstreet, which spends on the School of Mines £800, on the Museum of Practical Geology £5,275, on the Geological Survey, including that of Ireland, £5,500—total, £11,575. 2. The Department of Practical Art costs £17,920, including the local Schools of Design. 3. For Ireland the Government expends on the Industrial Museum, under Sir Robert Kane, £3,348, and on the Dublin Society

£6,340. The cost of its support of the provincial colleges in that country we have not at hand; but this is certain, that between the national schools and the provincial colleges the people of Ireland are provided with much better means of education in practical science than the people of England. We are not aware of the amount of scientific expenditure by the Government in Scotland. If that country receives but little, it does not get its share; and considering how it has been treated in the matter of the Ordnance survey, and how long it was silent under that treatment, we shall begin to suspect that our northern neighbours are losing some of that acumen in money matters for which they have hitherto enjoyed the reputation. In the matter of metropolitan museums there is much want of system. We have lately seen the authorities of the Tower and the British Museum bidding against each other for the same suit of ancient armour. In the Museum of Practical Geology there is much which has a very remote connection with geology. The statues, for instance—the historic collection of porcelain, of glass, and of painting in enamel, are more appropriate to the Museum of Practical Art at Marlborough House. The bronze tools and weapons and the golden ornaments from the Irish bogs should be among the antiquities in the British Museum. On the other hand, the collection of fossils, minerals, and shells of the latter would be a valuable acquisition to an establishment where geology and mineralogy are taught; and as its museum is open three days in the week as gratuitously as the British Museum, the mere sight-seeing part of the public would have little reason to complain of the removal.

Then, again, most of the science which is taught at the late School of Mines, now the College of Practical Science, is taught in the London University and King's College. In the provinces we have long had the universities of Durham and the colleges of Lampeter and St. Bees. They are chiefly frequented by divinity students. If they do not teach practical science to the neighbouring agricultural, mining, manufacturing, and commercial population, why do they not? If it is for want of funds, would it not be more economical for the Government to aid them, and to found new institutions?

Besides the Government expenditure, there is that of a multitude of establishments for the promotion of science and practice supported by voluntary contributions. There are a host of athenæums, mechanics' institutes, agricultural associations, and farmers' clubs. A few of these are, and all of them might be made, available for instruction in practical science, if remodelled and put under the responsible control of some central superintending body,

on which science and practice should be duly represented.

Among them, they must be raising enormous sums. Then there is the chemical department of the Royal Agricultural Society. Its laboratory is chiefly one of research. It is educational only so far as regards any young men who may be admitted as pupils and assistants. As a laboratory of research and instruction it might be rendered more efficient with more extended means. It is in every way worthy of Government aid, unless the society prefer being perfectly independent. The same may be said of the Veterinary College, and the like of the Cirencester Agricultural College, on which we have before remarked. In the manufacturing districts a growing desire for industrial education is evinced by the establishment of Owen's College at Manchester, and the Pottery School of Art. Lastly, there are the funds of our venerable free schools, so far as they can be made available. Ancient statutes and founders' wills are delicate things to deal with, but an Act of Parliament can even deal with them. If they prescribed a particular course of study, it was because no other was then in existence. Most of those institutions were founded at a time when they could teach nothing but Latin and Greek and the ancient geometry, because there was nothing else to teach. Bacon and Newton and natural philosophy had then no existence; chemistry and astronomy had not burst from the shells of alchemy and judicial astrology. If the founders were prescribing a course of education now, designed to enable youths of limited means to earn an honest livelihood, they would doubtless have included instruction in every branch of useful knowledge. By adherence to the letter rather than the spirit of the statutes, the benevolent intentions of the founders have been rendered nugatory. In many instances the free schools which they established have sunk into total oblivion, and their funds have been misappropriated by various bodies, sole and corporate. In others there exists a schoolmaster without a schoolhouse, or both without scholars, because there is now no demand in the neighbourhood for the kind of instruction prescribed. Some of the most flourishing of these establishments have deviated widely from the statutes and founders' intentions, and have become either boarding schools of the "private genteel" order, or public schools in which the sons of the higher classes are prepared for the universities and the learned professions, but from which every possible pain is taken to drive the day boys—those for whose behoof they were founded—the youth of the immediate neighbourhood, to whom an industrial education would now be of inestimable advantage.

We would propose, then, that every large town, in which its inhabitants and those of the vicinity may feel sufficiently desirous of industrial education, should erect a suitable building. The Government should provide and pay the lecturers, and receive payment from the students, as at the Jermyn Street College. As a preliminary, a searching inquiry should be made respecting the endowments for educational purposes existing in the neighbourhood, and how applied. Wherever practicable, the new establishment should be engrafted on the old. The charges for instruction should be moderate; in no instance should it be gratuitous, except in the form of exhibitions, as rewards for proficiency, like those attached to the Jermyn-street establishment by Prince Albert, from the funds of the Duchy of Cornwall. In every county there should be a laboratory for instruction in analysis, and there the higher school or college should be established. The laboratory establishment must be stationary.

The lectures at the schools might—at any rate, in the first instance—be delivered by peripatetic philosophers. We might have lecturers in Eyre as well as itinerant Judges, taking their respective circuits. The professors of the Jermyn-street College might take the home circuit, and lecture to the country round London. Their session lasts about four months: they would therefore suffice for three other establishments—Norwich, York, Durham, Newcastle, Birmingham, Manchester, Bristol, Exeter, with many other seats of the varied industry of England, might be centres of instruction for other districts. Oxford and Cambridge would, we have no doubt, readily contribute their share in diffusing over the surrounding country some of the knowledge which they possess. Education in the sciences applicable to the arts would be thus placed within the reach of all those who may deem it worth paying for, at an easy rate. It would be forced upon none who think they can do better without it.

#### BROAD CLOVER v. COW GRASS.

As the time is at hand for sowing artificial grasses, I wish to impress upon the cultivators of these grasses the importance of the above subject, and beg their attention to a few extracts bearing upon it, with the view of directing their course at the present seed time:—

SIR H. DAVY.—“The broad-leaved cultivated clover (*Trifolium pratense*)—at the time the seed is ripe, the produce from a rich clayey loam is—

Grass.....	49,005 lbs. per acre.
Hay.....	12,251     ”
Nutritive matter ....	1,914     ”

SINCLAIR.—“The cow grass (*Trifolium medium*)—at the time of flowering the produce from a rich black loam is—

Grass.....	20,418 lbs. per acre.
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“The broad-leaved cultivated clover (*Trifolium pratense*), at the time of flowering, affords of nutritive matter, from the produce of one acre of a clayey loam, 1,861 lbs.; from the produce of lattermath, taken at two different times, 930 lbs. Total, 2,791 lbs. per acre in one year.

“The cow grass (*Trifolium medium*) affords of nutritive matter, from the produce at the time of flowering, 717 lbs.; from the produce of the lattermath, at two different cuttings, 670 lbs. Total, 1,387 lbs. per acre in one year.

“The weight of nutritive matter, in which the produce of one acre of the broad-leaved cultivated clover exceeds that of cow grass, is 1,404 lbs. per acre in one year.

“In regard to produce, therefore, the biennial rooted clover is superior to the perennial, in the proportion of nearly 2 to 1.”

The distinguishing characteristics of the two varieties appear to be this:—The broad clover has a somewhat spindle-shaped root, with but few fibres, grows more upright, has fewer hairs on the stem and leaves, thrives luxuriantly, stem generally hollow or pipey, broad leaves, and reddish-purple flowers; the cow grass has a somewhat creeping root, the stem grows zigzag and less globular than the clover, and is solid or pithy, with a narrower leaf, which with the flowers have a paler hue: it comes into flower from twelve to fourteen days later than the clover.

The chemical analyses do not vary much—not sufficiently so to cause the general adoption of alternately cultivating broad clover and cow grass. For instance—

	Broad Clover.	Cow Grass.
Silica.....	59	63
Lime.....	22.62	24.56
Magnesia.....	4.08	4.52
Potash.....	36.45	34.72
Carbonic acid.....	23.47	25.51
Phosphoric acid.....	6.71	5.41
Sulphuric acid.....	1.85	1.08
Dried ash.....	9.56	7.97

I hope these short extracts will sufficiently show the superiority of the broad red clover over the marle or cow grass, and they will prevent the latter from being so much cultivated as a substitute for the former. Cow grass is, in fact, only adapted for permanent pastures, and never ought to be cultivated in the ordinary routine of business, except when required for seed. It is, indeed, very inferior to the broad clover for a single year's service. Broad clover

is a biennial plant, cow grass a perennial one: the former will die in the third year, the latter never. I was induced, in the spring of 1851, to sow cow grass instead of broad clover, being told it was becoming a general practice where the land was liable to clover sickness; that if I had less herbage I should have more hay, and also better food for my stock. I sowed 32 acres of it, and my plant was good, but the difference in produce astonished me. My clover crops were generally so heavy as to require very frequently two cuts with the scythe before making one swathe, but here was no trouble to my men, and my stacks of hay presented a sorry figure. *My experience* is very decisive: I cannot estimate my crop at two-thirds my usual produce.

As to its being a preventive against clover sickness, if I may so put it, I have very grave doubts. It appears in all its leading features to be one and the same plant: its chemical extractions from both the soil and the atmosphere are nearly the same; its roots are rather creeping in character (as such, it gains no access to deeper-laid food for its sustenance than the clover); its yield of hay is certainly proportionately greater; it will not dry away so much; but then the produce in grass is so much less that it by no means compensates. Again: if the produce

(as Mr. Sinclair states) is nearly double that of cow grass, what a large amount of food is gained! what manure! and if fed off, instead of mown, what a valuable return to the soil! There is no artificial grass equally productive, or so well adapted for grazing; and its succulence can be readily corrected by giving the stock a small allowance of beans, peas, or barley. The better course is to allow the crop to obtain a fair growth, and not to feed it off too close: both cattle and sheep will then thrive fast upon it.

The proper time of sowing is from the middle of March to the middle of May.

The quantity of seed should vary according to the soil, season, and mode of putting it in. If sown broadcast, about 14 lbs. per acre; if drilled, about 10 lbs. per acre of good seed is sufficient.

The soil should in all cases, and under whatever crop, be so prepared as to have the requisite quantity of loose soil to cover in the seed on being lightly harrowed. It may be prepared by hoeing, harrowing, rolling, &c., &c. It is desirable to drill between the rows of corn, which is constantly done after wheat-hoeing. If the land is light or soil loose, the seed will frequently after a good shower of rain grow well without being harrowed or rolled-in. Rolling, however, is generally preferable on light soils. P. F.

## IRISH PEAT CHARCOAL.

While we do not wish to be thought amongst those who condemn the Irish peat charcoal as thoroughly useless, and as a manure, or as a vehicle for manure quite worthless, neither can we go the length of those who claim for it virtues and properties of an unparalleled character. That it is valuable—nay, as a deodorant, invaluable—those who have seen the experiments at the urinals of the York railway station, where the utmost sweetness prevails in the hottest and closest weather, and have compared it with the state of almost any other water or air-tight plans adopted at other stations, will not readily deny. That the matter detained is of a valuable manurial character, no one who has the slightest knowledge of vegetable chemistry can for a moment doubt. But if we carry it further—if we consider this kind of charcoal as anything more than finely pulverized material of the same kind, as comprehending the long list of materials some time ago given as constituents of the Irish peat, we shall, how true soever the fact might be, find ourselves under a delusion.

Admitting the Irish peat to be richer than other peat in valuable mineral matters—in pyroligneous, sulphuric, and other acids—the very act of charring will do much to dissipate these materials, if not altogether destroy them.

And then, such is the durability—the almost indestructibility, we had nearly said—of charcoal, that we hardly see how any plant could long be benefited by the mineral constituents of the ash of this element, being locked up in the form which it seems fire is almost necessary to disintegrate.

The “*Revue Horticole*” contains some startling facts as to the effect of charcoal on flowers.—Roses of a faded colour. The experimentalist covered the earth in the pot with pulverized charcoal about half-an-inch deep. In a few days the flower bloomed a beautiful and lively colour. He took away the charcoal, and put fresh earth. Next spring the flowers were again pale and discoloured. He applied charcoal as before, and the deep rosy red colour was again established. Violets and petunias the writer also found had their colours intensified by the application of the charcoal. Mr. Cuthill, of Camberwell, a great advocate of the peat charcoal, proves it to be useful as a manure either alone, mixed, or saturated with drainage. Mr. Burnell testifies to its use on strawberries, cabbages, and peas and beans. Mr. Hepburn, of Lycoming, U. S., says it much improves the texture of the American soils, and describes it as one of the “cheapest and most efficacious of manures.”

To come to its effects more in an agricultural

point of view, Mr. Hunter's experiments with potatoes are of a highly satisfactory character. He planted them — Yorkshire Regents — with 20 tons per imperial acre of fresh horse dung, and added several mixtures. Without any application but the manure, the crop was 15 tons 13 cwt. 47 lbs. per acre. With 2½ cwt. of wood charcoal, 25 tons 13 cwt. 44 lbs. per acre. In several other experiments with lime, salt, &c., improvements in the crop took place, but in no case to the same extent as with the addition of the charcoal.

Mr. Hudson's experiments (of Castle Acre) will always have great weight with agriculturists as coming from one of the best farmers in England. The whole land had ten three-horse cartloads of farm-yard manure per acre, and to this he added rape-cake on one lot, Swede-turnip manure on another, peat-charcoal saturated with urine on a third, and peat-charcoal with night-soil on a fourth.

The following was the result in tons per acre:—

Rape cake .....	20 tons.	
Swede manure.....	23 „	11 cwt.
Peat urinated .....	23 „	11 „
Peat night-soiled .....	21 „	„

The cost of the peat charcoal dressing was hardly one-half the amount of either of the other applications.

On the same side with these results of a thoroughly practical man are those of the scientific L. V. Harcourt.

He tried how far manures would help him to increase the produce of his soil, having the field first manured with 15 loads of farm-yard dung. He made several additions afterwards—Peruvian guano in varying quantities, muriate, sulphate and phosphate of ammonia, and peat charcoal saturated with night-soil. We select from the latter the results produced by one hundred weight of each per acre added to the soil, as compared with the land adjoining without application, and showing the profit or loss of the course pursued.

1 cwt. of Peruvian guano produced 42 bush. } 4 gals. per acre .....	} loss 3s. 9d.
Without it, 41 bush. 2 gals. per acre .....	
1 cwt. Muriate of ammonia, 45 bush. .... } Without it, 43 bush. 1 gal. ....	} loss 12s. 7½d.
1 cwt. Phosphate of ammonia, 50 bush. .... } Without it, 41 bush. 7 gals. ....	
1 cwt. of peat charcoal and night-soil, 45 bush. } Without it, 41 bush. 2 gals. ....	} profit 32s. 6d.

Now it is impossible not to see the very extraordinary state of things indicated in the above statements. While the ammonia in both its states increased the produce 2 bushels per acre, the night-soiled peat charcoal increased it 4 bushels per acre, but the ammonia combined with phosphoric acid enhanced it 8 bushels per acre; so that the latter manure had by far the most power over the soil

in promoting its productiveness. Still, the comparative cheapness of the application of the saturated peat charcoal, made *that* by far the most profitable; for, while the cost of the greatest increase amounted to five shillings and sixpence more than its value, the addition of four bushels per acre at so slight a cost made the absolute profit almost into a rent—say, one pound two shillings and sixpence. Mr. Harcourt ascribes the effect not to the inorganic particles of the night-soil which the charcoal might have taken up, but to “the carbonic acid being combined with ammonia and absorbed by the charcoal, and preserved from the loss to which it is subjected by its volatility.”

The experiments of the Yorkshire Agricultural Society, made in 1850, show that while peat charcoal alone is almost worthless, yet, saturated with its weight of urine, it will increase turnips as compared with nothing. Thus—

	Tons.	cwt.	qr.
In Mr. Charnock's case ....	3	13	1
„ Mr. Craykes' .....	8	9	3
„ Mr. Linton's .....	1	3	0
„ Mr. Stevenson's .....	4	6	7
„ Mr. Thompson's .....	6	3	7

Nevertheless it abundantly proves that this is an increase not at all sufficient, as against no manure, to warrant saturated peat charcoal being used alone, or in any other way than as an auxiliary to other applications. For, if we take five tons or even ten as the natural produce of a field, it is clear that the ratio of these increases will not make the result an average or profitable crop of turnips.

GREAT SALE OF POULTRY.—Another sale took place at Baker-street on the 14th ult., by Mr. Stafford. The birds were the property of Mr. Fox, of Skinner-street, and comprised Cochin-China, Spanish, and Poland fowls. Many of the birds were very good, but they were not brought up in such fine condition as were those of Messrs. Punchard and Potts. The high estimation in which Mr. Andrews's breed is held will be seen by those who have the opportunity of seeing a priced catalogue; a hen bred by that gentleman, No. 36, made 15*l.* 15*s.*; a cock, “Captain,” 27*l.*; a hen, No. 48, 18*l.* 18*s.*; another, No. 50, 16*l.* 16*s.*; No. 51, 10*l.* 10*s.*; No. 52, 18*l.* 10*s.* With the exception of No. 45, a cock, 43*l.*, these were the principal prices realized. It is matter of doubt whether the result, as a whole, does not indicate decline in the value of these birds. They had been carefully selected, and many of them bought at great, almost unlimited prices, and yet the average was not four-and-a-half guineas per head. This would have been a large, almost an incredible sum a few years since, but it is not equal to what we have seen in the last three months. 135 lots made 629*l.* 7*s.* Spanish appear to be rising in estimation; 25 lots went for 105*l.* 14*s.*; three hens sold for 30*l.* 10*s.*, and one cock 12*l.* The Polands were several of them very meritorious birds, but found little favour; 16 lots made but 17*l.* 1*s.*; certainly not more than one-third of their value, if estimated by the result of previous sales.



## DRAINAGE OF THE TEST AND ANTON VALLEYS.

In the whole range of agricultural improvement, none is so essentially requisite as thorough drainage; while none, again, is beset with so many, or at least such serious difficulties of attainment. The large outlay that must be provided—the one of the many systems to be selected for operation—and the really efficient performance of the work entered upon—all press weightily enough on the attention of the improving landlord. But even these are not all. A man may build, fell timber, level hedgerows—all within the ring of his own fence, and all entirely on his own account. In entering on the drainage of his property, however, he but seldom can take the same independent position. His neighbours must be consulted, and, if possible, associated with him in the undertaking; for on their co-operation may often rest the perfect realization of his intentions.

But neighbours, unhappily, cannot always be depended on, even in the pursuit of an object of mutual benefit. The display of a wrong colour at the election, the rumoured assault on a cock pheasant, or the suspected "turn-out" of a vixen, may stay for years and years the carrying out of a work that would tend to individual gain as well as to public advantage. Coupling these with the difficulties we have already referred to, it is by no means astonishing to find so much of the land in this country still but imperfectly drained. They are difficulties, nevertheless, that must be overcome; while the services of a stranger may often effect that which the best of neighbours might fail to accomplish. If there be any such stranger, with means, knowledge, and inclination to back his proffered assistance, it is our duty to notice, if not indeed to welcome him.

We have been led into these remarks from reading an account of an important meeting lately held at Romsey, in Hampshire, and over which Lord Palmerston presided. The object was to receive a report from the "Land Drainage Company" on the proposed drainage by this body of the Test and Anton Valleys. We regret we have not space for the report itself, which certainly strikes us as almost unnecessarily prolix and elongated. It is, however, carefully prepared and soundly considered; and we may cull from it the design and the result, so far, of the Company's efforts in the county of Hants. Despite the encouragement of many influential landlords, the want of thorough co-operation is yet the grand difficulty. It is thus acknowledged in the opening of the report:

"The survey, embracing the whole of the united valleys from Whitechurch and Andover to Redbridge, has necessarily included the properties of many proprietors who have not yet notified their assent, and the time and expence bestowed on the preparation of the details have been consequently very considerable, and extended by the prevailing wet weather of the last four months.

"The total area comprised within the survey is 12,163 acres; while the extent of lands belonging to proprietors assenting to the survey is less than 5,000 acres; and of this portion not more than 1,882 will be directly benefited by the operations at present proposed."

The design was unquestionably a grand one; we are sorry to see it, as yet, so little appreciated. Unfortunately, too, it is not the drones only who suffer from their apathy. In the very next paragraph, we find that—

"The situation of some of the lands of the assenting proprietors included in the survey is so circumstanced as to make it expedient to defer their improvement; for instance, we found the extent of these lands in certain districts so small compared with that of proprietors who had not signified their assents, that we have deemed it too expensive to deal with them. We refer, particularly, to lands near Redbridge, and near Stockbridge; in the latter of which instances a most remarkable advantage might be gained by giving vent to the water which now stagnates in the land above Stockbridge—a town built upon one of the natural bars or weirs of the Valley, by a direct cut across Stockbridge-street into the Marsh Lake below the town. Here is an area of 314 acres susceptible of becoming as profitable as any land in the valleys."

It is not our purpose to go into any analysis of the system determined on; still we are glad to see from the following, that any further co-operation from other landowners, at present standing aloof, will be provided for in the operations commenced independently of them. In the areas already portioned out it has been determined—

"I. To select such points of discharge or outfalls as shall afford capabilities of draining the land of each area to the full depth prescribed, independently of any other area.

"II. To fix the boundaries of each drainage area so that its pre-determination may not offer any obstacle to the extension of the system of operation as the works of improvement proceed, and other landowners fall into the general plan."

As far as we have had an opportunity of studying the project, we are inclined to consider it a most healthy and politic one. The Company appears to possess every power for carrying out their plans;

and the "black mark" will surely rest against the names of those proprietors who refuse to avail themselves of this means for "bringing the land to its best uses." We might of course expect to find none but friends and supporters at the meeting in question; Mr. Denton, however, the engineer present, was closely questioned by Sir John Barker Mill, and other gentlemen, and the result was an unanimous expression in favour of the plan being persevered with.

We should wish it to be distinctly understood that we have no desire nor temptation to puff the Land Drainage Company. We simply call attention to a scheme emanating from them, that promises much for one of the first of agricultural improvements. They have selected a district, too, where some such aid as that they proffer is evidently much wanted. Result as it may, the intention is at least a good one; though, so far, scarcely as successful as its merits would seem to us to deserve.

## AGRICULTURAL STATISTICS.

It is surely worth a nation's enquiry to know its own agricultural resources. British agriculture has no right to be represented by a candle placed under a bushel, for science is neither ashamed of herself, nor of the result of her labours when applied to the soil, any more than to the manufacture and commerce of its produce; and those who cannot see the value of agricultural statistics to the public generally, as well as the farmer individually, with the progress of agricultural science involved, are blind to one of the most important positions of the age.

The progress of things demands many corresponding changes of the political systems and practices of our forefathers, and, among others, the progress of agricultural science demands agricultural statistics. If we cast the eye across Her Majesty's Statute Books of the Realm, we shall there perceive the strugglings which science has had in all ages in her progress onwards in the march of improvement, owing to the stubborn character of the field through which she has had to drive her team, from its being covered with dense forests of thorns and thistles luxuriating on its soil. Indeed, the complaints of farmers have in all times been familiar in the ears of the British Parliament, alike when her senators are under one roof at St. Stephen's, as when they were under the more distinguished patronage of St. George, St. Andrew, and St. Patrick, as the representatives of three distinct nations. At one period, for instance, we find the English farmer selling his wool on his sheep's back before it was shorn—the butcher selling his beef and mutton at so much per joint, leg, or lump, without regard to weight, and so forth. In such a barbarous state of things it was natural for commerce to complain, and her complaints to reach the ears of the parliament, when it was enacted that wool and butchers' meat, &c., must be sold at the King's beam and staple. Similar innovations were made with regard to the other daily necessities of life, so that farmers and others grumbled sadly for a time; but experience has long ago reconciled them to the progress of science and the propriety of those changes which commerce then effected. In the reign of Henry VII. statute was even found necessary to enforce the cultivation of the soil and the breaking up of grass lands to tillage, and the same subject appears to have engrossed the attention of the legislature during the reigns of the two succeeding monarchs.

During the reign of Henry VIII., however, a more elevated subject engaged the attention of commerce, for heritable things are now placed in the scales and found wanting—the lease of the tenant was found insecure. "The evils of voiding leases" was sorely experienced in all the provinces of England; hence statutory provision was made that "lessees might enjoy their farms." Leases made by landlords were declared valid against their heirs and successors, provided they were of ordinary duration, and for fair rents in cases of entails. From the days of Henry VIII. up to the commencement of the present century, the management of entails and church lands underwent various modifications. From 1800 to 1840, "Subletting of lands," "Recovery of possession of lands unlawfully held by tenants," "More effectual securing of rents," against "The granting of leases to joint tenants," and the "Subdivision of common lands," are respectively the subjects of statutory interference; and from 1840 to 1853 the permanent improvement of the soil engrosses attention. In Scotland circumstances were of a kindred character at these different periods, a few instances being rather in advance of this country as to the march of improvement; while in Ireland the reverse has always been experienced. In the days of Henry VIII., for instance, things were in a barbarous state in the sister country; for, in 1534, statute was found necessary to abolish the practice of demanding sheaves of corn in harvest, because it afforded "lesers" an opportunity of stealing under night from the field. At this period it was customary to effect the separation of the corn from the straw by burning the latter, and then winnowing the ashes from the former, which was thus parched after the manner of the parched corn of the ancient Hebrews, noticed by the inspired writers. Horses were also yoked to the plough and harness by their tails, the hair being allowed to grow long for the purpose. That such a practice would naturally increase the muscular action and strength of the tail, under fair management, is but reasonable to suppose; but even granting this—with the full strength of Celtic habit, always strong in the highest degree on things patriarchial—still the very idea of a dozen Irish parvons tugging and writhing in a plough so yoked, with half-a-dozen bare bony sons of the Green Isle in right good earnest urging on the team with a liberal allowance of the vernacular brogue and

shillelah, is rather calculated to excite merriment to modern minds than to convey any adequate knowledge of the *modus operandi* of such a practice or results flowing from it. But conceding the full force of the argument here involved, the fact cannot be questioned that the 10 and 11 of Charles I., cap. 15, and 10 and 11 of Charles I., cap. 17, abolishing—the former the practice of ploughing and harrowing by the tail and pulling the wool from the backs of living sheep, and the latter the burning of the straw in the separation of the corn from it—were looked upon by many a faithful follower of St. Patrick as grievous and wanton innovations on their rights, effected not for the purpose of advancing science and the progress of improvement in Ireland, but to gratify the new-fangled notions of heretic England, through whose dominant influence they were introduced. It was very natural, we say, for Irish farmers in those simple times to conclude that the flowing tail of a three-year-old horse, gelding, or mare, was a natural appendage for the purpose of drawing the plough, harrows, &c.; and that to prohibit the use of Nature's own gifts, as Nature herself ordains, was an heretic innovation which could not succeed well. And it may be very natural for some modern farmers to conclude, that for landlords to know exactly the number of bushels in a stack-yard in these crooked and selfish times which the over-crowded provinces of the United Kingdom now experience, does not augur well for their interest; but modern sticklers and old habits may experience an agreeable disappointment, as Irish farmers did in the abolition of the practices of their forefathers in the days of King Charles. For although it must always be admitted that prejudice is directly as the obtuseness of intellect, yet its natural character is common to all ages; and certain it is that Irish farmers have long ago got over the above innovations, and that nobler subjects now engross their minds. We here allude to *tenant-right* and the permanent improvement of the soil. It is rather a singular coincidence, that the Scotch farmer should have received what has generally, by way of distinction, been termed his first *tenant-right* in 1449, the English farmer in 1550, and the Irish farmer in 1634, making about a century between each of the United Kingdoms, and that Ireland should now, in 1853, appear before the legislature the foremost in the march of improvement.

From this hasty ramble over the past five centuries, it will readily be perceived that the whole is divided into a series of periods, each comprising its own progressive improvement; the first involving principally the duties and obligations of the tenant, and the last the duties and obligations of the landlord—progressive improvements which may be thus briefly recapitulated: *First*, there is the rude state of the ordinary operations of husbandry, agricultural and commercial; old practices are abolished, and improved ones enforced by statute. *Second*, no sooner is one evil knocked down than another rears its head in the shape of tenant's tenure; so that Parliament makes provision that farmers shall "enjoy their farms." *Third*, a new era of things, so to speak, commences with the present century. The three Parliaments are

now under one roof. Science places the permanent improvement of the British soil in the scales, and finds it wanting; but the public ear is not yet prepared to listen to measures so sweeping as her propositions involve. Parliament itself must first be reformed. Hence, the period is one of feudal experimentality, if we may use the phrase. Hitherto, tenants had done everything, and landlords comparatively little, towards the permanent improvement of the soil. It was beneath the dignity of the latter to enter a drain or ditch; and, therefore, feudal means must be resorted to, to carry into practice the propositions of science. Hence, Parliament provides improving leases, Montgomery statutes, common-enclosure bills, and what not—but to no purpose; for science is inexorable, holds up her infallible scales until conviction reaches the public heart. And *Fourth*, and lastly, from the Land's End to John o' Groats, furrow-drainage, with similar improvements of a permanent kind, is the general theme—one in which all join, and in which even the landlord himself is heard the loudest. Science is now respected as the help-mate of practice, and her maternal authority acknowledged, throughout the provinces. Farmers know well that all is hurly-burly and confusion in-doors when the "missus" is from home; and so it is in the field, in the absence of science. The principal barrier which is now experienced in the way of progress is the heavy chains of feudal times, which shackle the landlord. Parliament, however, ever willing and ever powerful in emergencies of this kind, grants a Government loan on redeeming interest. The experiment is crowned with success in Ireland, in England, and in Scotland. Old notions and practices, to which parties had so fondly clung for generations, as the only stay of the farmer, are repudiatingly thrown aside, while all eyes are eagerly turned towards the triumphant progress of science. Such is briefly the past; and although the future looms somewhat heavily in the distance, through the telescopes of some individuals, yet, generally speaking, the dawn of a better day begins to brighten the provinces.

Flattering, however, as may be the general prospects of the country in every department, science is, nevertheless, anything but satisfied with the progress she herself has made in agriculture—alike in the permanent improvement of the soil as the husbandry of its annual products. Landlords and tenants may, perhaps, justly conclude that they have done great things of late; but she avers that both lag behind in the march of improvement, the most that can be said of them being that they now manifest a laudable willingness to go a-head in the right direction, "hand-in-glove" together—a flattering tale, which history has never had the honour of telling before. Landlords and tenants, we repeat, never, in the history of British agriculture, for all that has been done, manifested a willingness to listen to the propositions of science so unanimously as they now do, and to reduce those propositions to practice, to the best of their abilities. Both parties are now satisfied that more capital must be chemically and mechanically invested in land, before general prosperity can be enjoyed, and that

they can only compete successfully with foreign agriculture through superior mechanical and chemical means, and a more economical subdivision of labour.

Before more capital can be successfully, or even safely, invested in land, the rights of landlords and tenants must undergo legislative revision; and the only solid foundation on which a thorough reformation of those rights can be based is agricultural statistics, for, before more capital can be safely invested either in the permanent improvement of the soil or the annual operations of tillage, the increase of produce which such an investment will produce must first be ascertained; and before this increase itself can be ascertained, the present amount must be known; hence the statistical conclusion at which we arrive. Now, the soundness of the theory, that the landlord and tenant should each receive a certain proportion of the produce according to their respective capitals invested, has generally been conceded to as sound; but, before those propositions can be received by each, the total produce itself must be first known; hence the statistical conclusion at which we again arrive. So that agricultural statistics is therefore a solid foundation, or rather it should be said, to do justice to the subject, the only solid foundation on which the rights of the landlord and tenant can be based, so as to enable them to invest the greatest amount of capital in the most judicious manner, and, by so doing, obtain annually from the soil

its maximum amount of produce—the grand result which science has in view.

In addition, therefore, to the five propositions enunciated by Mr. Shaw, at the London Farmers' Club, in 1846, the following two, of still greater importance to agriculture, may be adduced, viz.—

*First.* Agricultural statistics would enable landlords and tenants profitably to invest a larger amount of capital in the permanent improvement and annual cultivation of the soil than they otherwise could do; affording to capitalists, where loans had to be negotiated, a sufficient guarantee for the interest of their money.

*Second.* Agricultural statistics would enable landlords and tenants to settle, or rather control, the important question of "*tenant-right*" on sound principles, in accordance with the laws of financial science, satisfactory to both parties.

It will thus be perceived, that the statistical experiment about to be carried out in five of our provinces, under the patronage and support of the Government, and the Highland Society of Scotland, (the Royal Agricultural Society of England being precluded by their charter, as at present constituted, from discussing any question of a political or semi-political character,) is one of no ordinary importance to both landlords and tenants; and that, therefore, instead of throwing any opposition in the way, or even suspiciously putting an unwilling shoulder to the task, both should join heart and soul in the faithful performance of it.

## ON ECONOMICAL MODES OF FATTING STOCK.

SIR,—Although the eastern counties of England continue to be the great producers of meat to the metropolis, yet other counties, more celebrated for breeding, run them closer in grazing than formerly, and foreigners begin to profit by the example of Englishmen, and send us fat as well as lean stock.

Formerly there was a greater division between the fattening and breeding districts, and the choicest stock was consigned, as it were, direct from the breeders' hands to the graziers', arriving direct to them from a distance of perhaps several hundred miles. Now all this is altered: the breeders understand and practise the art of fattening nearly, if not quite, as well as the eastern graziers. They pick out the choicest of their flocks and herds for their own purposes, and the rest, sold to dealers, are picked and culled in their passage from fair to fair, till at last only the refuse—often, from their long journeys, infected with lung or foot disease—reach the eastern graziers' hands, and are sold to him at a high price.

Now, the remedy for this is not that the eastern graziers should immediately alter their system, and become breeders of stock on a large scale; for this would take time, and could not be so well and cheaply practised as on the extensive pasture grounds and mountain tracts of the present breeding districts: but the proper mode would be for neighbouring farmers to unite toge-

ther—few or many, according to circumstances and the size of their farms—and send accredited agents to purchase choice stock of the original breeders; such stock to be forwarded *direct* to the fattening district, there either to be sold by auction among the purchasers, and the profits or losses shared between them; or the stock divided in any other way that might seem fair and equitable.

Such a plan, generally practised, would put the grazing counties more on an equality with the breeding than they are at present.

The custom of making a double use of expensive cattle food—that of fattening in the first instance, and of producing first-rate manure—seems to have almost originated in the eastern grazing districts. I mean the modes by which expensive and richly-constituted food is given to animals as much to improve the quality of the manure and the fertility of the soil, as to rapidly fatten the animal, and where the profit of such expensive food is calculated quite as much on the increase of the crops arising from the manure as from the fat supplied by the food.

And that this is the natural and most healthy mode of supplying fertility is evident, for we obtain a double benefit—to the animal and to the crops. What has once been devoured and found wholesome for stock, cannot, even in its excrementitious state, be a poison to

them; while guano and the chemical manures, as superphosphate, &c., are in themselves a rank poison, and have been found, either from impregnating the roots grown from them, or from undissolved particles adhering to the bulb or its fangs, in many instances to have had very prejudicial effects—especially upon sheep.

But I intended making this paper an article on more economically fattening stock.

And to begin with bullocks. Although corn and cake roughly crushed are given with excellent effect, yet the cooking food increases the rapidity of fattening, and incorporates the different ingredients better together.

Cooking may be either steaming or boiling. The first is the best plan when roots are to be operated upon, as they contain a sufficient quantity of water in themselves; or when chaff, either of straw or of seed-stalks, is to be softened and improved by the process.

Layers of chaff are placed in large wooden boxes, and thickly sprinkled with barley or bean-meal, and thinly with linseed-meal; this, with a small quantity of salt added, forms excellent food. I have seen it practised on a farm where a fixed steam-engine was used, the steam being released at high-pressure and conveyed in pipes for a considerable distance without being cooled.

But boiling, in a general way, answers every purpose; is more easily understood by common labourers, less dangerous, and quite as economical.

The best mode is to use a double set of iron boilers (with tubs to hold the cooked food), holding—say 100 gallons each, with sufficient stock fattening to keep them constantly going, and to consume quickly all that is cooked, so that the coppers never cool and the cooked material never turns sour; for although a species of sourness, as I shall afterwards show, is useful in fattening both oxen and hogs, yet that stale, mouldy sourness arising from over-kept food is very injurious, as producing griping, disrelish of food, and purging.

Mr. Warnes has shown us some excellent modes of cooking linseed, and other compound food; I shall, therefore, only give a few which I think would prove useful.

No. 1. Fill a hundred-gallon copper two-thirds with water; then, as a due mixture of mucilaginous, oleaginous, and saccharine particles go to form a rapidly fattening food, put in one bushel of finely-ground rape-cake and one bushel of saccharine cake—that is, cake made from rice or meal, in which the saccharine principle is developed by means of sulphuric acid, a starch-sugar in fact—then, when dissolved, and the water boiling hot, sprinkle in four bushels of bean or pea and four bushels of barleymeal. Give while slightly warm; the quantity, about twenty-eight pounds each day, mixed with chaff. Add to the water half-a-pound of carbonate of soda. This neutralizes the bitter of the rape-cake, and prevents the compound turning sour.

2. Steep eight bushels of barley till the saccharine principle shows itself. Fill the copper half full of water; dissolve two bushels of crushed linseed, and add the barley.

3. A foreign mode, where cooking is not employed, but the fermentative principle instead. In finishing

bullocks in Limousin, France, they give with turnips, for the last three weeks, a drink made of rye flour mixed with water to the consistence of a paste, and left three, four, or five days to ferment and become sour. This is diluted with water, and thickened to a certain degree with hay cut into chaff. This the oxen drink. A large ox consumes about twenty-two pounds of rye a-day, always given sour; and some add a leaven to ensure this sourness.

4. Linseed-cake crushed fine, soaked in cold water till dissolved (twelve hours are sufficient), and then well mixed with dry chaff, working the ingredients well together. This is not so good a method as that of cooking, but it is less troublesome.

Hogs.—In fattening hogs, we should recollect that they are partly carnivorous as well as herbivorous, and that oily food will hasten their fattening as well as bullocks; but while for bullocks we use the oil of plants, for hogs we use with advantage animal food.

No. 1. Fill the copper two-thirds with water; let it boil; then add twenty-five to fifty pounds of tallow-chandler's greaves (beginning and finishing their fattening with the less quantity); fill up with barley-meal—well working it with a brewer's rudder. Give while warm. It will take six or seven bushels of meal to a hundred-gallon copper to make the food as thick as it ought to be given.

2. If Blackhall's apparatus for steaming bones for manure is in use on the farm, then take the grease and gelatine produced by it from bone, and use in a similar way; or boil down any animal that dies from accident—not real disease (hundreds of sheep die in the lambing season) into soup, it will require a great deal of boiling to make the flesh drop off the bones; or take the fleshy portion of the Buenos Ayres animal manure, as being originally from healthy oxen, the refuse from their tallow dried in the sun; or fresh blood from the butchers; or the dried blood sometimes sold as manure; or fish, if near the sea; or whale blubber, the refuse of train oil if able to obtain it—these are all good fatteners if mixed with sufficient vegetable matter to correct their lusciousness; and if the animal part is wholly left out for a short time before selling the fat hog, there can be no objection to the diet. Then mix equal quantities of brewer's grains and ground buckwheat together—the first supplies mucilage, the last starch—and boil in the proportion of 5 of the vegetable to 1 of the animal.

3. Take equal quantities of parsnips and potatoes: pulp them up with a pulping machine; they will then require very little boiling, and will incorporate with one-sixth animal matter (this last must have been previously dissolved in as little water as possible); mix them together, and add as much meal as will bring them to a proper consistence. As all roots contain much water, very little extra liquid will be required in boiling.

Fattening fowls on a large scale might also form a profitable part of the farmer's business. Chickens, ducks, and geese may all be fattened on the hog mixtures; and suppose 500 chickens put up to fatten at once, and a fresh stock got in every six weeks or two months, the

returns would not be inconsiderable. Collecting and buying up the fowls lean, by means of higglers, and then selling them by commission in London, when fat, would be the means of doing this; and it would probably be a more profitable mode than that of breeding poultry. Nourishing food, warmth, darkness and quiet are indispensable. In winter warmth might be given by pipes leading from the boiling coppers. The food also should be given warm, and the poultry not be disturbed, or much light admitted to them except at feeding time.

From bullocks and hogs down to poultry, the principle should be to buy in lean stock, fatten as quickly as possible, sell out directly when fat, and buy in fresh ones to fatten, so as to keep up a constant process of fattening and selling. By proper means I have no doubt but that three lots of bullocks, or four lots of hogs, or eight or ten successive lots of poultry might be fattened in a year's time; which would be a far more rapid mode of turning money than breeding animals, or even than any kind of cropping. W.

### ON GROWING TURNIPS.—BENEFICIAL INFLUENCE OF LIQUID MANURE.

The beneficial influence of drilling manure in a liquid state was first mooted in the public journals of this country in 1844. Ten years before that period, the first inventor of a chemical seed manure, strongly urged the drilling of manure in the state of liquid. We well remember his saying in one of his letters at the time, that "Plants can no more live without water than animals;" and such, he went on to show, was the state of the land at turnip time, that the plants were left to shift almost for themselves, and that not a fair opportunity was given them to take up their food with the most favourable prospect of nourishment. But for years before—nay, we had almost said for centuries—the Dutch have gone on, not only using liquid manure, but converting the rape-cake and other artificial manures they used into liquid, in order, in that form, to apply them to the land.

The application of liquid was first suggested in practice in this country by the dissolving of bones in sulphuric acid. The Morayshire Farmers' Club appointed a committee to examine the experiments made by candidates for the premiums offered for the growth of turnips by new manures in 1843. The experiment of the Duke of Richmond, where two bushels of bone-dust were mixed with four hundred gallons of water per acre produced two tons above the average of any other application. Mr. D. D. Manson, of Spynie, showed an increase of nearly two tons per acre, obtained by diluting the manure with fifty gallons of water to one of the manure. Mr. G. McWilliam realized great advantages from the application in a liquid state; and the subsequent experiments of the Duke of Richmond, in 1844, on the barley which followed the turnips, showed but little inferior, if at all, from the cases where the manure had been applied in a dry state—not more than as a field varies, in one part from another.

But we were certainly not prepared for the astounding details given by Philip Pusey, Esq., in his recent article; and indeed they seem to have astonished himself. Now he has offered a

prize for the best liquid manure drill, to set the minds both of implement improvers and of agriculturists generally to work on the subject. We much admired the construction of a liquid manure drill—the first we saw exhibited at York, at the Royal Agricultural Society's show there; but we are informed that the acid decomposes the iron-work so rapidly, that it soon wears out under application of that acid to the land.

Might not glass be adopted, or even lead, in some of the working parts, so as to obviate this difficulty? The acid has by far less corroding effect on the last-named metal than on tin or iron.

Mr. Pusey's experiment is well worth recording. He tried water or liquid drilling against dry; and the result was that the latter required six horses, while the former needed only four—the latter occupied seven men and two boys, while the former required only two of each.

His turnips told up, however, wonderfully. The same quantity of superphosphate of lime was applied to the one as to the other. Certainly, there was a difference of five days in the sowing; and although this may seem a small matter in itself, still it will make a serious difference in point of value and weight of crop; which was increased by the fact of its occurring so late in July; although that, perhaps, is not a point so very important in Berkshire as it would be further north.

The produce of the turnips } water drilled was.....	} 13½ tons per acre.
Drilled dry .....	
Difference .....	7 "

Now, we think with Mr. Pusey, that there is a double advantage in this. The dryness of a season is often the cause of losing a crop, either through waiting until rain falls, or from a want of proper and rapid germination; while the water drill will at once set drought at defiance, and thus do more to supply a plant for the land than all other means put together. It will also push on the plant in its early stages, and thus increase the chances of the crop in a very great degree.

But the main advantage we take it, to be arising from the nature of the phosphoric acid itself. To mix it with ashes is, we fear, again to lock it up in the alkalis from which it has been driven, or partly driven by the sulphuric acid, thus reducing the treatment with acid into a mere disintegration of particles. But, so long as it is amply diluted with water, it comes into immediate contact with the soil in that precise spot where the plants require the food, and thus affords to the turnips the supply instantaneously.

Then, there is Mr. Pusey's own suggestion, that the manure will be more minutely diffused, so that each rootlet may have it to feed upon the more readily.

We are inclined to think that there are seasons when the growing of a turnip crop or roots may depend upon the possession of a water drill, especially in the midland and southern counties, where moisture is so deficient both in the soil and in the atmosphere. And when the land is parched, as it sometimes is in those counties, it may be worth while trying whether the drill may not advantageously be employed in *watering* the ridges with a little very weak guano water. The idea of *watering a field* may seem at first sight to be a wild and impracticable recommendation; but the adoption of a water drill will at once remove the apparent difficulty. Two men with the drill, or even one with two boys carting water, and diffusing an ounce of guano per gallon, will be an array not very formidable; and these will do at least twelve acres per day, or possibly twenty. We hope to see the experiment tried, for turnips sometimes suffer from drought to an immense extent in dry districts.

The experiments above referred to, on the use of superphosphate of lime for turnips, in the dry and in the liquid form, have a more important significance than appears on the surface. They open—we should rather say settle—the whole question of what we shall do with the liquid manure of our towns. The advocates of those views, which have so long been inculcated in the reports of the Central Board of Health, have gained a powerful ally in Mr. Pusey. There are few names which will carry greater weight among practical agriculturists. He is no reckless innovator, no visionary enthusiast, no rash experimentalist. No one has more frequently impressed on the farmers the almost superfluous caution against yielding too ready an ear to the suggestions of science, and against adopting them till verified by repeated experiment. No one deals more tenderly with ancient prejudices, or pays a greater deference to established usages. There are some who may think this deference almost excessive in one who is justly proud of the

vast improvements in agriculture which have been effected through the medium of the Royal Agricultural Society and its valuable *Journal*; because, every one of those improvements has been a victory—often hardly contested—over some local practice or time-honoured usage. On the other hand, there is no one, who, when he has seen reason for a change of practice, adopts it more unreservedly, and defends it with greater skill and boldness. The testimony of Mr. Pusey in favour of manure in the liquid form is the more valuable, because he has become a convert from opposite opinions. When the Duke of Richmond, acting on Liebig's suggestion, dissolved bones in sulphuric acid, and sprinkled the soil with the solution, Mr. Pusey deemed the dry method of application so much more suited to the practice of British agriculture, that he devised a very ingenious method of reducing bones to powder by fermentation with soil or ashes, &c., thus obtaining an approach to that minute state of division, which is one—but only one—of the advantages of using them in solution. Still more recently, in his admirable little work on the progress of English agriculture during the last ten years, we find him declaring liquid manure to be a pretty plaything, but solid manure to be the thing for real farming. We find him also demurring to the idea of the "burly English farmer washing his cow's bed" after the fashion of the *gülle*-making peasants of Switzerland. Mr. Pusey, however, has for some time been a strenuous advocate for irrigation, by means of catch-water meadows, which is in effect rather liquid manuring than irrigation; because the supply of water available for the water-meadows which he has formed at Pusey is so small, that in summer it is not more than sufficient to damp the soil by penetrating it to the depth of about six inches. This water, however, dissolves the solid droppings of the cattle which lie upon the surface, and it receives the drainage of several houses and farmsteads. At Pusey Lodge Farm, moreover, when about to irrigate, they cut the solid manure out of the channel in the farm-yard; and the sluices being drawn from above, the manure from the yards is draining into the channel all the time the water is passing through, and is found to have a very beneficial effect—running at first quite coloured, but after a time becoming clear, and diluting the acridity of the first washings. Mr. Lee, the engineer of the Board of Health, in describing this beautiful process, as he calls it, for converting solid manure into the liquid state, says that though the cost of irrigation in this case is greater than that of fertilizing by iron pipes, and flexible hose, and jet pipe, it is the most economical instance he has met with in England, Scotland, or Wales, of irri-

gation by open gutters and surface shedding. As to its results, Mr. Pusey himself declares, that small as the outlay has been, and recently as it has been made, it has doubled the assessment of the land to the income-tax, adding, even in these bad times, a pound an acre, and that he has no reason to complain.

These, then, are the results of practice at Pusey: 1—A much smaller stream of water than would be useful for mere irrigation produces wonderful effects upon grass lands, by means of farm-yard and other manure dissolved in it. 2—Superphosphate of lime, dissolved in water and applied by the water-drill to arable land, produces better crops of turnips than when applied in the dry form by the dust-drill. 3—The water-drill furnishes a cheaper mode of application than the dust-drill. 4—Mr. Pusey states that the farmers of Wiltshire find it advantageous to cart water two miles, in order to dissolve their superphosphate and distribute it by the water-drill.

Let us apply these facts to the sewage of towns. In that we have a vast supply of phosphates and other salts of great and tried manuring powers, ready dissolved to our hand. Shall we, at considerable expense, reduce them to the dry form, in order that they may be carted into the country, and then, re-dissolved in water, carted two miles? Is there any cheaper method of conveying these salts to the country than in bags, on carts and waggon? and of conveying water, than by horses in water-carts? Is there any cheaper mode of distributing them over the land than by means of the water-drill? Hydraulic engineers tell us that there is; and, in a matter so foreign to the established practice of agriculture, they must be deemed higher authority than the most experienced farmer. They know the diameter of cylinder, the length of piston-

stroke, the number of strokes per minute, and the consumption of coal per hour, which will raise a given weight of water a given height. They know the cost of an iron main necessary to convey that quantity of water a given distance, and the cost of the branch-pipes and apparatus necessary to distribute it over a given area. They tell us that the cheapest mode of conveying solid matter a distance of twenty or thirty miles is in suspension in water, through iron pipes, into which it is forced by steam-power; and that the cheapest mode of distributing it over the farm is by the same means. On the first point, they can appeal to the long experience of the water companies in bringing water from a distance for the supply of towns, and the cheap rate at which they can afford to sell it. On the latter point, they can appeal to the successful results of experiments which have been going on for some years, on several farms in England and Scotland, on the distribution of the manure of the farm by the steam-engine, and by pipes and hose, after being reduced to the liquid form. The only advantage which the water-drill has over this ultimately cheaper mode of distribution is, that it does not require capital to be sunk on plant to the amount of four or five pounds an acre—an amount inconvenient to most landlords and tenants. Let them, however, manifest a disposition to avail themselves of the assistance of capitalists in supplying them in this way with the manure of towns, dissolved in water; and they may obtain it, for an annual payment, which, including interest on capital, and repayment of principal, purchase of manure, and the working expenses of distribution, would be less than the mere cost of filling, carting, and spreading the solid manure of their own cattle, according to their present practice.

## EXPERIMENTS ON SUMMER SOILING.

The question of soiling animals in summer, as compared with depasturage in the field, is, as May-day approaches, a topic not altogether devoid of interest.

That more stock can be kept on the same area of land by soiling—we had almost said double the quantity—there can be no doubt. That the manure of house-fed animals is of far more value than when dropped in the field—that the cattle will keep healthy for a long period, with air, cleanliness, and proper shelter, provided they are regularly fed, without much exercise, is also abundantly proved. And these are all strong reasons, it would appear, for soiling; but there is the trouble and expense. A man, horse, and cart, are not kept going without considerable

outlay; and the manure is also more costly to remove than if it were dropped in the field. There is a wide difference, moreover, between summer and winter soiling. In the latter the men and carts are less employed, and the cost is very much reduced; but in the former the active demands of the farm usually require all the energies of the farmer, and he can seldom afford to lose a hand from his labour and a horse from his team.

The most recent evidences we have on summer soiling are the experiments of Mr. Templeton, of Clanboye, in Ireland, and Mr. Adam, of Rana, in Scotland; and they are certainly, on the whole, both in favour of the practice of summer soiling. The latter gentleman selected three lots of cattle:



the first were depastured out of doors, and left to shift for themselves; the second were tied up and curried daily; while the third lot had with their grass a regular allowance of linseed-cake and oats. In amount the green food consumed by the three lots is very strikingly different—

The first consumed 3 acres 2 roods 6 perches.  
 The second „ 1 „ 2 „ 35½ „  
 The third „ 1 „ 2 „ 35½ „

The two latter lots were cut two and three times, and consequently the land was considerably economized. But we cannot say the experiment was a fair one; for one and a-half cwt. of guano was added per acre to the two last plots of land after the first cutting, which, in fact, rendered the comparison of the land altogether worthless.

The relative value of the different animals only was estimated, and it is singular enough the increase of value in the first lot, consuming the produce of 3½ acres of land, was only estimated at about £2 1s. each. There must have been some sad mismanagement of them, or some accident, otherwise the difference could not have been so little for summer depasturage.

The increased value of the second lot was more by 5s. only than the first; so that the main saving here was in the food. The third increased £6 5s. each, showing that the two first lots had either had food insufficient in quantity or of indifferent quality. The experiment really does not seem to settle at all the point in dispute, further than as regards the saving of the land, and hence is neither satisfactory nor conclusive.

Mr. Templeton's experiments are of a very careful and scientific kind, and remind us more of those of Mr. Lawes. He gave the live weight of each individual animal, eighteen in all, and the varied increase of weight at different periods, through which we shall not travel, but simply give the general results. Part of the lots had grass only, part had cake. Taking the grass-fed animals first: Galloway Scots were commenced with on the 24th of April, and all kept alike till the 17th May, when they were fed on Italian rye-grass. The lot No. 2 were fed in boxes or hammels, with a small yard, having grass only. Another, No. 4, were tied by the head, and had the same allowance. A third, No. 6, were depastured in the field. The result on the 5th of February—eight months after the commencement of the experiment—was the following increase:—

	Cwt.	qrs.	lbs.
Hammel or box-fed . . . . .	9	2	0
Tied by the neck . . . . .	7	2	0
Depastured in the field . . . . .	5	3	0

But cake was also given to corresponding lots under each and similar circumstances. The results of these were as follow:—

	Cwt.	qrs.	lbs.
Hammel or box-fed, with 9 lbs. cake . . . . .	11	1	0
Tied by the neck, ditto ditto	9	1	0
Depastured with cake, ditto	10	2	0

Here we find a little difference in the scale, and somewhat more in favour of liberty with ample food, than over-confinement. The combination of the two experiments absolutely places depasturing in the fields and tying by the neck in the same position.

For if we combine the whole of the experiments, we find that—

	Cwt.	qrs.	lbs.
The hammel or box-fed in- creased . . . . .	20	3	0
The stall-fed . . . . .	16	3	0
The depastured . . . . .	16	1	0

The experiment being made with Galloways, however, it is not quite fair to stall-feeding, as the whole of the Scottish breeds of cattle prefer a greater or less amount of liberty; and we know that one of the gentlemen who so often carries away the prize at Smithfield with his Highland cattle, and who feeds large numbers for the Christmas market at Smithfield, always prefers allowing them yards, and a large amount of liberty, with a great deal of exposure, rather than keeping them in confinement.

Taking the last experiment of Mr. Templeton, we have, however, a very large difference between the box-fed and the depastured animals. A difference of upwards of five stone per animal, taking it only at 6s. per stone, is £1 10s.; and this certainly will pay for a great deal of trouble, when there are animals sufficient to keep a man constantly at work.

But the soiling system is one very impoverishing to the land; and unless it is well kept up by artificial means, it cannot be sustained for any lengthened period, without serious deterioration to the fertility of the soil.

We think, however, where the grass land is inferior, and has to be kept up by artificial means, the soiling is the best system; but in rich alluvial pastures, which will fatten a beast on an acre in summer, the man would be little better than insane who would attempt to soil his animals.

“WHAT COURSE OUGHT FARMERS, INDIVIDUALLY AND COLLECTIVELY, TO PURSUE, UNDER THE ALTERED CIRCUMSTANCES IN WHICH THEY ARE PLACED?”

The above question underwent a discussion at the London Farmers' Club, on Monday, the 7th of February last, but, so far as I could discover, with no very satisfactory result. I am disposed to view the efforts of this club to enlighten their brethren with more than ordinary favour, and shall at all times rejoice in their success. I know something of the difficulties to be overcome, and do not at all times expect their discussions to meet with unqualified approval. On the question before us I think the agricultural public—the “farmers, individually and collectively”—will not be great gainers. Nothing new, or even novel, was produced, and much of what was said had but little reference to the “course farmers ought to pursue.” I wish the discussion had taken a more practical bearing, and that some of the new theories had been tried by practical tests; or, rather, that they had been examined in a more practical way. Poor Mr. Mechi and his farming, as usual, came before them; Mr. Caird and high farming was also alluded to, and in no commendable spirit. This is all very well, but it is not quite worthy of the standing which I wish to see the London Farmers' Club occupying. I want them to lead us onward. We are not content with common topics—common-places; no, nor plain, practical, business-like discussions. I think modern agriculture must be greatly, very greatly extended, and in many ways—yes, many hitherto unheard-of ways; and I should have been pleased to witness the Club take up some new course—break ground afresh—even at the risk of failure. We are assured that something out of the usual course of husbandry must be adopted, or farmers cannot, as a class, keep their position; and it is to this point I desire to call attention.

I acknowledge the great importance of the leading topics proposed to the agricultural body with the view of promoting progress: high farming—extended education—economy in labour—deep draining—improved machinery—improved culture—artificial manures—cultivation of more root-crops, fibre-crops, &c., and the like, are recommended to tenants; cheap transfer of land—liberal covenants—improved farmsteads—equitable tenant-right—long and improving leases, to landlords; alteration of the law of settlement, and education, to labourers; and to all, abolition of the malt tax and hop duties—the collection of agricultural statistics—equalization of taxation—transfer of rent-charge to consolidated

fund—union ratings: these, and many other minor topics, are advocated by agricultural improvers. All are requisite if agriculture is to keep progressing—if fairly dealt with.

I again ask, What are farmers to do?—Can nothing be devised for their own adoption?—Can any alteration be made in their farming operations and business procedure likely to turn to good account?—I should have been better pleased with a discussion on these points. Much also might have been suggested of a truly good practical nature, which a farmer could at once fall in with, and be benefited by. The majority of farmers desire to know what to adopt, and what to avoid, in modern theories, as applied to agriculture; and I know of no body of men to whom I would rather look for direction on these matters than the London Farmers' Club. They must not however treat subjects lightly.

What are farmers to do under their altered circumstances? I cannot satisfactorily answer the question, but will suggest a few things for their consideration, with the view of reducing them to practice if possible.

1st. *Combination to help each other.*—Is the district in which you farm one well qualified to grow flax? Then, join together in erecting a *flax mill*, with all necessary apparatus for economically making the best of the crop.

Will it grow beet-root of good quality? Then join in the manufacture of *beet-root sugar*: the refuse is a very valuable food for stock.

Will it grow good crops of potatoes? Sell the sound ones, and join in fitting up apparatus for the manufacture of *starch* from the diseased ones: the refuse is capital food for pigs.

Will it grow good crops of mustard, rape, or other oleaginous seeds? Then join in erecting an *oil-mill*. You have your cake for food or manure, your mustard and oil for sale.

Will it grow wood, chicory, or ultimately even tobacco? Then join in mills and machinery for making the most of these crops.

Do you want cheap artificial manures? Then join in fitting up appliances in every neighbouring town for deodorizing its sewage.

I need not carry combinations further. It is obvious to what an unlimited extent, under judicious regulations and management, they might go.

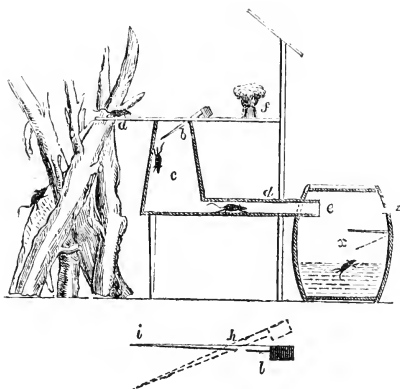
2nd. *Individual effort to make the farm most productive.*—Is the district in which you farm

merely qualified to yield the ordinary grain and root crops, and these, it may be, are only to be obtained by good culture and at great cost? I have not room to particularize the various soils, but, as a general rule, I would observe, be not too solicitous to grow many grain crops. Grow abundant root crops: 10 tons of mangolds, or 30 tons of turnips, or cabbages, or potatoes, &c., eaten off with grain, will fatten more stock—*i. e.*, produce more profit in meat—than any corn crop, and yield large supplies of manure.

In your grazing, commence your fattening process early in life; keep all the stock you can, and supply them with your pulse and much of your barley crops. You will make more profit of your crops in this way, besides retaining this part of your produce in manure.

Keep none other than profitable stock: be it of whatsoever kind, your farmsteads and other appliances for fattening and shelter should be as roomy, convenient, and plentiful as possible. P. F.

## A NEW RAT TRAP.



We give our readers this month the representation of a rat-trap, which, we believe, is the most perfect known. The advantages of this mode are that it is always ready, obviating all necessity of visiting that part of it frequented by rats, and which, in the use of traps, soon renders them shy and suspicious. The animal is taken out of the trap at one place away from the one where he gets in, and this place is so distant that his drowning creates no alarm to the others. The mode was found so effectual by the inventor, that he turned rats loose, marked, on a wager that he would re-take them—which he did in a few days after. In fact, the sagacity of the animal is no security against this trap.

The mode of putting it into operation is, to select some out-house, not in use, which can be locked against children and others who would be liable to cause disturbance. A pile of old logs and limbs is made, forming a road and harbour for them in the house leading to the passage *a*, which

is a board laid flat horizontally, in the middle of which is the fall *i*, in cut No. 2, which gives way to them as indicated at *b*, in cut No. 1. *C* is a box made with smooth converging sides, to preclude the possibility of climbing out; *d* is a passage way leading some distance out through the wall of the building in which the box *c* and the pile of logs are. The wall or partition should be at *d*, as shown in the cut; *e* is a barrel or larger cask containing some water, with a small shelf made to turn under a small weight, as indicated in the cut at *x*. Just above this shelf is a small hole in the side of the cask, as shown at *z*, to encourage the rat to jump from the end of the passage way, *d*. The cask is sunk partly in the earth.

The plan is to make the place in the house as inviting to rats as possible, by quietude, and also by strewing straw and occasional wheat ears about the trap, and to get them thoroughly baited before trying to catch them. For this purpose, the falling floor *i* (No. 2), turning on a pivot at *h*,

should be so constructed that they will be obliged to cross it to get at the bait, and should be fastened until they become thoroughly accustomed to it. The bait ought not to be put upon it, but strewn carelessly about and beyond it, as shown by the wheat-sheaf *f*. Upon the right construction of this falling floor depends mainly the success of the plan. It is made with a weight (*l*) sufficient to bring it at once to its level after having been thrown down, as shown in the dotted line in No. 2. At the end it partly rests upon a sort of knob, so as to be sufficient to bear a little pressure; for a rat always tries any suspicious place with his fore feet, like a cat; but when he gets on it, it must give way

under him. The rat thus precipitated to the bottom of the box *e*, follows the passage *d* to the cask *e*, and observing a shelf with a little light on the opposite side of the cask, he leaps on it and is dropped at once into the water, while the shelf returns to its place ready for another. The whole operation of the trap—if well made—is silent and sure. The farmer has only to go to the cask *outside the building* and take out the dead rats daily. For bait, light coloured malt scented with oil of caraway is the best bait that can be used.

N.B. The falling floor may be 3 or 4 inches wide, and 12 or 15 inches long.

### CULTIVATION OF PASTURE LAND.

The season reminds us of the necessity of saying a word for the much neglected grass land. The majority of parties, who take the utmost pains with their tillage, seem to think that their grass is a different matter, and that it may very well take care of itself. Nor is it often better treated when first laid down. Land is by far too frequently first-cropped as long as it will produce seed again, and then laid down to become permanent pasture. Great credit is taken if the land is made summer-fallow before the close of the corn-cropping; but too often a fallow crop is also taken, to *protect* the seeds, for fear they should grow too luxuriantly.

Others take greater care. They grow no crop of corn; they pay a high price for well selected and carefully grown grass-seeds, and, possibly, they sow the land in fine mechanical condition; still they are sometimes disappointed, and blame the seedsman if they do not find his finer grasses grow as plentifully or luxuriantly as they could wish. The fact is, the wonder ought to be that any should grow at all.

Sometimes grass land is taken out, to improve and lay down again to pasture. But the process adopted is one of depletion, and not of nutrition. They crop away with corn so long as crops are obtainable, and then take great credit if the land gets a dose of lime when it is laid down to grass. And often the grass, after the *improvement*, is worse than that which preceded—carries less stock, and maintains them in a manner far inferior to what it did before.

The old grass land of the farm is seldom acted fairly by. It must give up all, and receive nothing in return. If it is mown, a little rotten chaff, or waste scrapings, is a liberal allowance. If not, it is considered that no manure is necessary. Though milking cattle and store stock are depastured upon it, and carry all off year after year, no addition

of manure of any value is made to the soil for this serious abstraction. In rich alluvial feeding pastures it is unnecessary, but where store cattle of any kind are depastured the land must inevitably deteriorate.

To begin with the beginning, land to lay down with grass should be as carefully prepared as for any other green crop; the one being permanent however, and the other only temporary, the greater care should be taken of the preparation; this being is of *more* consequence than seeds. There are always natural grass-seeds in every soil, lying ready for germination and growth as soon as the manurial or feeding elements of the soil are ready for their development. On this principle it is that a dressing of mountain lime will bring into action seeds of white clover where a white clover plant was never known to have existed before. So on a very rich stubble, on almost any soil, there will be found the finest grasses growing in rich luxuriance, after the corn crop is taken off, without a single seed being sown. In like manner, one year will bring a vast smother of trefoil on land where none was ever sown.

Hence, to be rich—to have abundance of phosphoric acid in a free state—to have a full supply of ammoniacal matter, are of more importance than being particular to a shade in the selection of grasses. It is only a question of time. If the land be rich and fertile, there will be found a growth of the finest grasses which are adapted to the soil, and these will soon eat out those which are more or less unsuitable.

So in improving a pasture; it is not always necessary to take it out into tillage. If hide-bound, a good heavy loaming, a few fresh seeds, and a compost dressing will soon recover it. If mossy, the moss will soon disappear before good cultivation. *It is nature's covering for land too poor to*

grow grass; and on stone walls, rocks, and similar places, the moss appears for simply the same reason—it is a covering preparatory to the production of more nutrient material.

Rushes and similar plants, due to the prevalence of stagnant water, are to be disposed of in another way, namely, by proper and efficient drainage.

But a ready mode of transferring pasture from one field to another has been adopted, and not without success. A field, properly levelled and prepared, has had a cover of turf or sods, pared some two and a-half inches thick, and so placed upon it, at a cost not exceeding fifty shillings per acre, including cartage; this has been slightly manured and well rolled, an advantage to the turf, and a rapid accession of permanent grass pasture to the arable. This is a mode far preferable to that of inoculation. Grass will be had at a much earlier period, and, if well followed up by dressings of manure, it will soon become a pasture as permanent in appearance as if it had been lying in that state for ages. In fact, it will have acquired the age of its surface.

For grass-land, it is not always necessary to apply farmyard manure. Guano will have the most powerful and speedy effects on a pasture, if applied before rain. If that does not pretty rapidly follow, there will be great loss by the application. Bones produce a wonderful effect on the Cheshire pastures—denuded of their phosphorus by the cheese sold away from the farms, which it so supplies; but the majority of clay grass-lands will require the bones to be dissolved before any very striking effect can be produced. The light land grass—the greatest difficulty of all, which the Scotchman would say ought always to be converted into arable, and only allowed to lay down for two or three years—may be dressed with a compost of clay and dissolved bones with the greatest advantage. If the house bones of most of our farmers were from time to time to be put in an earthenware jar half full of sulphuric acid, and this poured from time to time on a heap of clay, a vast quantity of the most valuable manure would be made from materials at present wasted.

## THE SHEEP—ITS IMPORTANCE, VARIETIES, MANAGEMENT, AND DISEASES.

BY AGRICOLA.

The sheep competition to which our agriculturists are exposed in consequence of the Repeal of the Corn-laws, has naturally awakened in them a spirit of enquiry as to the best means of meeting it, and led them to consider whether any, and what improvement can be effected in our system of farming economy, whereby a fair return may be realized for the capital invested in the soil. The experience of late years has fully proved that the sheet anchor of the cultivator is the green crop system; crops to be converted into manure by the depasturing of cattle and sheep, alternating between those of corn and pulse. The most important consideration which presents itself, is the best mode of converting them, and the animals most fitted to accomplish it.

It will require but a small knowledge of the science of agriculture to convince the general reader, that in reference to at least three-fourths of the arable lands of this kingdom, the sheep stands forth as the most prominent, indispensable agent for that purpose. The ox and the swine are most useful auxiliaries to the farmer's HOME manure heap, as also may be stall-fed sheep on a small scale; but on our large farms, on the thin poor soils, varying in size from five hundred to two thousand acres each, it must be obvious that the

system of shed-feeding to a large extent, is altogether incompatible with the course of husbandry required to be practised on such description of soils, and that there is no other animal, which, without detriment to itself, or injury to the land, can perform that essential part of good farming on light porous soils, the consumption of the food, and consequent conversion into manure on the field which produces it. Nor can the manure in the shape of grasses or other green crops, be so effectively carried from one part of the farm to another, as by these animated manure carts.

In estimating the value of the sheep to the arable land farmer, its capacity for this purpose must ever be considered; without its aid in this particular, two-thirds of the annual corn crops must be manured at much greater cost than at present, and the unbroken Downs, whose herbage is through this agency now carried into the cultivated bottoms, would be comparatively, but so much profitless waste; and when we take into account the almost incalculable importance of the growth of wool to this island of manufacturers—when we reflect that with the advances of civilization, the tastes and habits of a people become more refined and delicate—and when we are daily witnessing the fact that the demand for the coarser food of our fore-

fathers is rapidly declining, and that mutton above all other meat, has the call of the market as the substitute—it must, we think, be admitted, that the sheep, in a national point of view, claims our first and greatest attention in the list of live stock, both in breeding and general management. Time was, and that of no distant date, when sheep husbandry was a secondary consideration; not to go farther back than the commencement of the present century, we find the price of corn so extravagantly high, that every available acre was devoted to its growth, and the land already in tillage forced beyond the limits of production, consistent with good farming, and a general enclosure of all sheep-walks considered capable of bearing corn, was at the same time effected. With wheat at from 80s. to 132s. per quarter, little room was left for the sheep on arable lands; just so many as positive necessity, or stringent covenants, compelled the tenant to keep, were to be found, but little attention was paid to them—it was enough so that it was of the sheep kind, no matter what its form or qualities. In too many instances nothing further was regarded than its capacity to live on half a supply of food, to scramble over the widely extended farm, and devour the weeds which a scourging course of cropping had engendered in the stubbles, and to assist in consolidating the then fresh-broken Down, by the process termed treading, which consisted in driving the flock in a compact body several times in succession on such lands newly sown with wheat. These were the chief purposes for which sheep on arable lands were then used; but soon after the close of the war in 1815, a new era seems to have arisen in sheep breeding; gradually the price of corn became less remunerative; periodically the laws regulating its importation were altered and modified; population rapidly increased; manufactures and commerce, under the fostering influence of universal peace, began to extend, and the demand for wool exceeded the supply; every encouragement existed to induce the agricultural world to turn its more particular attention to this branch of its business, independently of the absolute necessity which existed of adopting a system of husbandry, by which the soil, exhausted by a ceaseless repetition of corn crops, might be restored to its former fertility.

To provide for the extra supply of sheep which these combined circumstances called into existence, no other alternative remained but to commence the alternate system of cropping, viz., green crops intervening between each crop of corn, which until now had only been practised by a few of the more enlightened of the farmers, and before the adoption of which the practice of fattening mutton on arable land was to be found only in exceptional

cases, where the bold minds of the “few” had ventured to break through the trammels with which custom had surrounded them, and make isolated, yet scarcely recognised experiments of a system, now in our day universally prevailing. With the improvement of the means, more attention began to be paid to the animal to be fed; the ill-shaped, carelessly bred sheep, with which the country abounded, gave way to one of more symmetrical proportions, whose carcase formed a better foundation whence to raise the superstructure of mutton and wool, in less time, and with far more profitable results; the encouragement which the then few owners of good animals received in the great and increasing demand for them, stimulated other enterprising spirits to enter the field of competition, and from that hour the improvement of British sheep has gone rapidly forward, until it has reached a point of excellence nearly allied to perfection, and certainly unapproached by any other country in the world.

As our present purpose is to confine ourselves to the history of the modern sheep, and to the varieties which experience has proved to be best adapted to the requirements of the present day, we shall select from the general schedule of the breeds those descriptions most in favour with breeders and graziers, giving as faithful and impartial a selection of the characteristics of each as possible, and the particular position it is destined to occupy in our system of mixed husbandry. In this list may be placed the Southdown, the Leicester, the Cotswold, the Dorset, the Somerset, the Hampshire-down.

Amongst the finer qualities, the Southdown holds the foremost rank, and in noticing its present high position it would be an injustice to omit the names of breeders who have so eminently contributed by their skill and perseverance to raise it to its present excellence. The first acknowledged great improver we find in the person of the late Mr. Ellman, of Glynde, Sussex, father of the respected family now resident in that county. From a sheep which Arthur Young, writing in 1776, describes as “thin-chinned, low fore-quarters, and rising back-bone,” three most important and unsightly failings, that gentlemen succeeded in producing a straight-backed, well-proportioned, kindly animal, well marked in colour, with a fleece, originally light, much increased in weight. Upon this foundation it is no detriment to the fame of Mr. Ellman to observe, that modern breeders have still further improved, by attaining greater size, more aptitude to fatten, with a still heavier fleece, with greater length of staple. Among others of celebrity, we find the flocks of Mr. Jonas Webb, of Babraham, Cambridge, Mr. Sainsbury, of Wilt-

shire, Messrs. Grantham, and the Duke of Richmond occupying the foremost ranks. The improved breed is now fit for the butcher a year earlier than formerly. Where the taste of the epicure is to be consulted, old mutton required, parks to be grazed, or on arable lands of dry soil in a warm locality—these sheep may be kept to greater advantage than any others; they are also particularly adapted for folding, travelling long distances without injury, making a close bite on short herbage, but in the winter season are not so good proof against wet and dirt on strong soils in exposed situations.

The Leicester, for grazing purposes, on rich pastures, where no folding is required, the temperature warm, and when weight of carcase with early maturity are in view, is perhaps to be preferred to all others, especially when we remember that it has partaken of an equal share with other breeds of the improvements of the day; for we no longer find them as in the days of Bakewell, beautiful indeed in symmetry and high in blood, but too often like so many rolling tallow tubs, fit more for the chandler's than the butcher's shop, and *partly* covered with a fleece of wool only two-thirds of its present weight. There is now a better intermixture of muscle or lean meat with the fat, by which the quality of the mutton is much improved, and the fleece is a third heavier, without having suffered any deterioration in quality.

The third class we have enumerated, the Cotswolds, in former days were of a large yet rather coarse-grained carcase, with a very heavy fleece of wool, possessing a good proportion of lean, more hardy than the Leicester, by judicious crossing with which they have been much improved—arriving earlier at maturity, yielding a fleece of finer quality, scarcely diminished in weight, and adapted to the same purposes to which the Leicesters alone had hitherto been devoted, with the additional advantage of retaining with the cross their original hardier nature. The produce of the cross is styled the "improved Cotswolds," bred chiefly in Oxfordshire and Gloucestershire, from the hills of which latter country they derive their name. Acclimated on this elevated part of the kingdom and feeding on pasture far inferior to the rich herbage on which the Leicesters are in the habit of grazing, it was to be expected that they would be characterized by a disposition to improve when removed into warmer soils and fuller keep. We have known them wintered on the arable soils of Hampshire, in the open air, with hay and turnips only, become superfluously fat, while other breeds fed on the same food, side by side, have barely sustained themselves in store condition.

But in appreciating the merits of the different

varieties as connected with the green crop system on arable land, we must take into consideration their aptitude to fulfil the purposes required of them. In describing the character of the Hampshire Down, which also prevails over a great part of Wiltshire, we must bear this point continually in mind:—These counties, from their open fields and system of farming, are peculiarly adapted for store or breeding ewes, and the rearing of such a description of lamb as will suit the feeders who come to their great fairs in the summer for the purpose of purchasing, with the view of bringing them out the following spring as well-fattened mutton for the London market. The aim, therefore, of the Hampshire and Wiltshire breeders is to combine size, quality, aptitude to arrive at early maturity, and a heavy fleece, of good quality, with a constitution sufficiently hardy to undergo the process of consuming the green crops and folding on the ground where they grow, thereby leaving a full dressing for the crop of corn which is to follow. Now it will be at once apparent, that the task of forming, as it were, an animal in which shall be combined the necessary qualities for these several purposes, requires the soundest judgment and constant care, and is attended with many difficulties. The better points of different breeds require to be fused into one mould; this daring exploit—for daring it was declared to be by a public bigotted to old customs, and prejudiced against the smallest deviation from the beaten tract of their ancestors, has been made with signal success, by many of the more enlightened flock-masters of these counties.

They saw population had so gained on the heels of production, that a greater weight of meat was unusually required to be grown; that simultaneously with increase of number of sheep, they bethought themselves that to improve the symmetry, increase the aptitude to fatten, and to arrive at heavier weights, with the same food, might be quite as economical a mode of supplying the increasing demand, as to effect it solely by the increase of numbers. They had before their eyes the parent breeds of the matchless Southdowns, Leicesters, and improved Cotswolds; these, in their separate state, were unfitted for the system of arable land farming, as well as for the description of carcase which has the "call" in the market at the present day; to meet the requirements of both, an amalgamation was decided on, and the result, a carcase of mutton exhibiting the early maturity of the Leicesters, the muscle or rich lean of the Cotswold, and the superior grain of the Down; a carcase "ripe" at fourteen months old, instead of three or four years as formerly. From this admixture, assisted by the original Hampshire breed,

which was founded about the middle of the present century, on (the then prevailing breed of the country), the old horned ewe and Sussex ram, the present new Hampshire breed was formed. No long pedigree of what is called purity of blood can be claimed by any Hampshire flock-master; but he has the satisfaction of knowing that it is the cross which he has made that constitutes the value of his stock; for neither of the parent breeds from which he derived it, can claim comparison with his own, for the union of qualities necessary to form the most useful, and best adapted sheep for the profitable consumption of his green crops, or so satisfactorily to meet the demands of the consumers of mutton or of wool. Nor has he any cause to doubt but that by the same judicious selection which has immortalized the name of a Bakewell, an Ellman, or a Webb, he may *perpetuate* the breed with a success equal to that he has experienced in producing it.

We have hitherto spoken only of those breeds generally considered best adapted for the production of mutton. Another most important branch of sheep breeding is the rearing and fattening of early lambs, for which purpose there are distinct breeds especially fitted; among these the Dorsetshire and Somersetshire have long been pre-eminent; nor can all the art of the flock-master avail in imparting this valuable characteristic to any other breed; neither is there any other ewe capable of forcing her progeny so quickly into the market for slaughtering; nor are these propensities the consequence of any local circumstances, influenced, as may be supposed, by rich, stimulating food. In all situations these two varieties will be found to drop their lambs three months before any other breed, produce a great number of twins, and yield a more abundant supply of milk; and it is no uncommon occurrence for a flock of Dorset ewes to produce two crops of lambs in one year; but the practice is not to be recommended, as nature becomes the sooner exhausted, and the value of the ewe consequently deteriorated.

The lambs fall in October and November, and when fed under cover are called house lamb, becoming, with good management, fit for the butcher soon after Christmas, realizing a high price, and being an article at that season of comparative scarcity, and also from the delicate whiteness of the flesh, of great luxury, it is eagerly purchased by the wealthy, at from 10s. 8d. to 12s. the quarter of about 9lbs. weight. Those fed in the open air are ready for Easter lambs, and keep up the supply until the grass lamb of the Southdown and other breeds comes in about the beginning of May. The ewes of full age, so soon as the lambs are disposed

of, are kept on high feed for about ten weeks, and then sent fat to market.

Contemporaneously with the higher value, the study of the nature, habits, and usages of the sheep engaged the attention of the flock-master. In its natural state, like all other animals unfettered by the hand of man, it enjoys uninterrupted health; but the artificial methods of treating it, under our modern system of agriculture, has rendered it liable to casualties and diseases unknown on its native pastures, which require the watchful care of the shepherd to avert or remedy; nor is it less necessary to exercise this unremitting watchfulness when aiming at successful and profitable breeding; for without judicious management, and a thorough knowledge of its habits, sheep will starve in the midst of plenty, and their food, instead of being profitably consumed, will be converted into a bane and a poison. The period of the year, at which we now write, that of yearning, being the most important and anxious, through which the flock-master has to lead his fleecy charge, we commence our observations on "general management," by considering the best method of dealing with ewes great with lamb, taking the Southdowns and Hampshire-downs first in order, which descriptions are now dropping their lambs, and being more under the influence of *artificial* management than other breeds, are subject to greater losses, and consequently require more care and attention at this critical season.

One first and paramount object, never to be lost sight of in sheep breeding, is to observe the happy medium in the quantity of food, and strict regularity in supplying it, above all things avoiding sudden changes from low to high keep, or *vice versa*. A breach of this rule, long experience teaches us, will result in a greater mortality of the flock than any other cause, and many of the diseases which were unknown to our forefathers, but making oftentimes such fearful havoc in these days, may be traced to their management, and the artificial system of feeding, rather than to epidemic, or atmospheric influences.

The first requirement to be secured at the commencement of the yearning season is a convenient lambing-fold; the construction of which should be regulated by the strictest attention to cleanliness and free ventilation. If the conveniences likely to be wanted at this busy and important juncture are not provided beforehand, the shepherd will have but little time to attend to their provision when his duties in the lambing fold actually begin. Should the weather or other circumstances be then adverse much greater labour and anxiety will be entailed on him, probably in addition to heavy losses. Shelter is of the first importance to the new-dropped lambs;



but it should be so secured as not to create a close and unnatural warmth, which is as foreign to the sheep's natural atmosphere as it is prejudicial to its health, and if (in the absence of actual disease) the animal's respiration becomes quicker than usual—evidenced by the heaving or “fetching” of the flank; the shepherd needs no other notice to warn him that his temperature is too high, and must be lowered if he would escape the mortality resulting from inflammatory disorders, the peculiar plague of the sheep kind under modern treatment, and more prevalent at yeaning time than any other, both in dam and offspring. It is well, and indeed requisite, to have well sheltered coops, or little stalls for the weak or twin lambs, to be placed immediately on their birth; but they should be constructed of *moveable* materials, such as thatched hurdles, bundles of straw, reeds, &c., so that they may be turned and adapted to every shifting of the wind and storm. It is the custom of most flockmasters in Hampshire and Wiltshire, to have their lambing fold in the open field, near enough to the homestall to be accessible to the ceaseless visits of the master, whose constant supervision is as necessary as the presence of his shepherd; for if lambs fall fast, much confusion will prevail in spite of every precaution, more especially should any of the numerous species of mortality, to which even lambs of a few hours old are liable, prevail. Ewes are sometimes unkindly in taking to their young, more particularly if young, and the labour protracted, are often short of milk; and if, under such circumstances, the weather be rough and very cold, the mortality will keep pace with the production. Moreover, shepherds like other mortals are fallible; with a run of ‘good luck’, all may go ‘merry as a marriage bell’ whether he sleep or wake; but in a harassing, flurrying period, when the labours are incessant, and excitement great, night being (or ought to be) no resting time for him, wearied in body and (as a good shepherd will be interested in the fate of his flock) perhaps depressed in spirits by losses or mischances, the frequent presence of the master to such a man is above all things necessary to cheer, encourage, and assist him in his labours and anxiety, to steer his woolly patients safely through the perilous hour of nature's sorest trial.

The system of feeding the ewe flock at this time is a matter for careful consideration at this season, as also some little time previous to it. Unable to select for themselves, and subject to an artificial treatment, as well as living on artificial food, which even our green crops is allowed to be, as compared with the natural pasturage of the sheep, every practical method should be adopted which may as far as possible compensate for the loss of those natural herbs which act medicinally as well as for food, and which

Providence has provided for all creatures and in its proper season, and to seek which an unerring instinct is implanted by the same All-directing hand. Next to free access to the natural herbage, grass, a due admixture of green and dry food seems to be the most effectual to keep the constitution in that healthy state essential to the season of parturition; when turnips are plentiful we have always found it beneficial to give half turnips and half hay; for this purpose the field proposed to be fed off should be at a moderate distance from the lambing-fold, and manured for the turnips with farm-yard manure, which will permit of the stock being driven off, after eating their pitching in the day time, and lying in the more sheltered lambing-fold during the night, the yard manure furnishing an ample dressing, with which the sheep leave, during the time they are feeding, for the following corn crop. It happens, however, sometimes that it is impossible so to arrange that the ewes can have any turnips at this time, in which case it is necessary to depend chiefly on hay on all upland farms; while thus fed, a small supply of wholesome water is indispensable: the practice of many people is to drive them to a pond or river to drink, but to this plan there are many serious objections; having access to water only once in the twenty-four hours, the ewes, urged by great thirst, not only run to the drinking pool in too great a hurry, and in too close a body, consistent with their “delicate situation,” but often drink to repletion, overload the stomach with water, and consequently weaken those powers which nature requires to be vigorous and free at the time the lamb is brought forth. When water must be given, it is far preferable to place the fold in such a situation, that the ewes may draw backward and forward to the pond at any time when inclined to drink, and there will then be no fear of over-gorging themselves. Where this is not practicable, it should be drawn in water carts, and given in troughs, taking care always to keep up the supply; the extra labour will be amply repaid in the greater safety of the flock, as compared with the risk incurred in daily driving them to water.

Our former remark as to regularity of feeding applies more particularly to this period; great care should be taken that no sudden flush of milk, the sure consequence of higher feeding, should be given to ewes immediately preceding the time of lambing; we have known from one-third to one-half of the finest lambs of a large flock die within 24 hours of their birth, owing to a sudden and great increase of milk, the effect of changing the keep from mild meadow to rich clover hay; and we have also known the mortality as suddenly stopped, by turning the ewes over grass land, thereby diminishing their appetite for the hay, the cause of the wholesale fatality,

which consists of violent diarrhoea in the lamb, terminating in inflammation of the bowels, vulgarly termed "the scour,"—as to any medicine being effectual in checking the disease, it is utterly hopeless at this tender age; we have seen the strongest lambs up, and sucking the mother within ten minutes of yeating, with no symptoms of disease, dead within twelve hours after; we have seen them gamboling round the fold of a moonlight night, light, and frolicsome as squirrels, and in the morning, at day-break, picked up three or four out of a hundred, dead and stiff, all from this fatal cause. That medicine may be prepared largely to benefit lambs of older growth, we do not dispute; and the experience of a quarter of a century, founded on unremitting personal attendance on the sheep fold, and the fairest trials of every nostrum recommended, even by eminent medical men, leads us unhesitatingly to declare our conviction, that there is no cure to be hoped for at this stage of the lamb's existence from medicine. Preventive measures, such as we have recommended, may be adopted; but cure, when the disease is virulent, there is none. This sometimes fearful scourge is unknown to those descriptions of sheep which constantly feed on grass, hence an evident proof that it is produced by our artificial system of sheep husbandry.

The next great enemy the sheep breeder has to encounter, is inflammation in the ewe after lambing; the prevalence of this disorder depends very much on the system of the animal: when it is too full of blood, and consequently more susceptible of inflammation, many severe losses are sustained from what is commonly called "heaving"—which is endeavouring to get rid of a something which instinct teaches her is not natural to her; that something

is the swelling of the organs employed in bringing forth the lamb, under the irritating influence of which she endeavours to expel it through the natural course—these efforts, involuntary at the commencement, increase the mischief, and death is the never failing termination. This complaint is also frequently induced by an imperfect delivery. In this case a medical practitioner, or the shepherd under his directions, may sometimes relieve the patient; but the breeder would do well to study all suggestions for prevention rather than calculate on the success of speculative nostrums.

The best agents employed internally by way of medicine to the sheep are castor oil when a cleansing is required, and laudanum when the system is sought to be composed; when after a severe labour, the bowels become torpid or obstructed, we have given with success two table-spoons-full of the former, with from 43 to 60 drops of the latter; these two medicinal agents appear to operate on the system of the sheep; but it is as nothing, to those who have not witnessed it, to hear the little effect medicines in general have on these animals. We have given five ounces of salt to a sheep, and with a view of being satisfied of its effects, shut it up in a horse stall, with the bottom completely cleared out, so that all effects might be visible. There was not the least alteration in the action of the bowels, the salts having no more power than so much water; there was no mistake about the quantity, for we dissolved and administered them with our own hands.

Having extended our article to an inconvenient length, we must defer the consideration of the other diseases, summer management, &c., to a future opportunity.—Wiltshire County Mirror.

## THE AGRICULTURAL DISTRICTS OF ENGLAND.

[FROM THE TIMES' COMMISSIONER.]

DEC. 23.

The position of the tenant farmers of England next demands our attention. To show the progress which has been made in the art of agriculture in this country, it is not necessary to go back to any authority of the last century for a description of the processes then adopted. Every county presents contrasts abundantly instructive, the most antiquated and most modern systems being found side by side. The successful practices of one farm or one county are unknown or unheeded in the next. On one side a hedge, in some counties, a plough with five horses and two men, and on the other side of the same hedge a plough with two horses and one man, are doing precisely the same amount of work. In adjoining fields may be seen a foul turnip crop under 10 tons an acre, and a luxuriant one above

30. On neighbouring farms of similar soil the wheat crop may vary from 20 to 40 bushels an acre, and most probably the man who grows 20 pays not less than 9s. for thrashing that quantity by hand, while the other thrashes his 40 bushels by steam for 3s. 6d.

In the preceding letters the details of good farming are given much more at length than instances of the reverse, as it was from the first only that instruction could be drawn. This was from no want of examples of antiquated farming; for if we spent one day in examining Sir John Conroy's farm at Arborfield, Mr. Hudson's at Castleacre, Mr. Beasley's at Overstone, or Lord Hatherton's at Teddesley, we were almost sure to be wandering on the next through the mazes of frequent hedgerows, gazing at five horses elaborately doing the work of two, ma-

nure suffered to go to waste, cattle insufficiently housed and fed, land undrained and unproductive, and farmers complaining, not without reason, of their want of success. One day we learnt the processes by which Mr. Huxtable economises labour, manure, and food; and the next we saw in operation an antiquated farming machine, precisely the same as Arthur Young described it 80 years ago, and worthy of the days before the Conquest; manure treated as a troublesome nuisance, and cattle wasting their substance and their food by being kept starving in the open fields in winter. The same day on which we saw the steam engine of Mr. Thomas, of Liddington, in Bedfordshire, with which he is enabled to thrash his wheat crop for 1d. a bushel, we found other farmers paying four or five times as much for the same operation, not so well done, by hand. On one farm in Suffolk we have seen the land prepared for turnips by skim ploughing, scarifying, and one deep furrow, at a cost not exceeding 25s. an acre; and on another, of precisely the same kind of land, the farmer was compelled by covenant to give his land four or five furrows, with repeated harrowing and rolling, to effect the same object at more than double the cost.

Nor are these small economies to be despised. On the two corn crops of a four course rotation, the different expense of thrashing by hand and by steam will amount to 8s. an acre, which being saved on the half of the ploughed land of the farm, is equivalent to 4s. an acre on the whole of it; and that is equal, in many cases, to a reduction of 20 per cent. in the rent. The saving of seed which Sir John Conroy has effected by having his land in such a high state of cultivation, is, as compared with the average quantity sown in similar districts of England, quite equal to a saving of 10 per cent. on the common rent of corn lands. But this is a saving of more limited application, inasmuch as a very thin sown crop is later in ripening and more subject to mildew, and, unless accompanied by the most careful and continued hoeing, more favourable to weeds, besides being more easily affected by casualties of season, all which are serious objections in a moist or northern climate.

It would be only repeating what has been much better done by Mr. Pusey, in the 26th number of the "Royal Agricultural Society's Journal," if we were to draw into one view the savings which the modern farmer can effect, by the use of improved machines, cheaper feeding stuffs and manures, and more economical and rational processes of husbandry. There is scarcely a single county in which the reader of these letters will not find some practice better than his own, some process by which he may increase his crops, or fatten his stock, at less expense than it has hitherto cost him. Some counties are much more advanced than others, and accordingly present more numerous examples for instruction; but the careful student will find, in the description of every county, local practices which long experience has brought to a high state of perfection. By combining with his own what he learns of the best, and rejecting the practices of the worst, he may establish for himself a system of agriculture suited to his particular soil and climate, founded on the experience of successful practical men. He will find that the best farmers have not attained success by blind adherence to a

given rotation, but by a constant adaptation of their plans to the growing wants of the country, taking advantage of railway or steam-boat communications to cheapen the cost of transit to the best markets, and of portable manures or cattle food to replace the exhaustion caused by the increasing abstraction of corn and stock from the farm.

The question, what is the best rotation of crops, is so variously answered in these letters, that the reader may have some difficulty in arriving at a satisfactory conclusion. The Norfolk, or four course rotation, is undoubtedly the one most generally approved; but it is to its principle of alternate corn and cattle crops, rather than to a strict adherence to its original detail, that this approval is accorded. In many cases we have inspected farms managed, on a strict four course, to the highest pitch which the land under that system would yield. Do what he could, the farmer was unable to calculate with certainty on the success of each crop in the course. The clover failed, or the turnips were diseased. The barley was too heavy and did not fill, or the wheat lost root and proved thin. Farm as high as he could, his unvarying routine of crops had exhausted something from his light soil which the aids at his command did not exactly replace. He drops the half of the clover from the course and substitutes winter beans. This succeeds, and he is tempted to his again. Mangel is taken instead of a portion of try turnips, and white or yellow turnips are grown where swedes were before. In the next round the position of these crops is reversed. His green crops now flourish, and he turns his attention to the corn. He finds that, by enriching his land, he improves the wheat crop, but endangers the barley. He cannot grow heavy crops of roots without manure, and he knows that to feed his sheep with profit he must hasten them forward by the aid of corn and cake. The land must, therefore, be enriched, and as with such high condition the barley might be lost, he sows the ground with wheat. An excellent crop of wheat reduces this condition sufficiently to admit of a safe and productive barley crop, which costs him nothing for manure, and very little for labour. But in this process of improvement the four course has disappeared, and been replaced by a five, so arranged that red clover, white clover and trefoil, winter beans, and mangel, swedes, and turnips, are respectively repeated on the same ground at no shorter intervals than fifteen years. The course then stands thus:—

1. One-third clover, one-third white clover and trefoil, one-third winter beans.

2. Wheat.

3. One-third mangold, one-third swedes, one-third turnips.

4. Wheat.

5. Barley.

And that in the course of time will, without doubt, in its turn give place to another, under the guidance of further experience. Near a large population, where there is a demand for vegetables, and a supply of street manure, the farmer may find himself better paid by green crops than corn. Accordingly we have found the most intelligent farmers in such situations employ two-thirds of their land in growing green crops, and one-third in corn. In the western counties the climate exercises a powerful influence

and the successful farmers of Lancashire take two corn crops and two green crops alternately. In short, the detail is everywhere varied by the judicious agriculturist to suit the necessities and advantages of the particular locality, when he is permitted by his agreement and has sufficient skill to pursue a rational system.

The reader will see that no one system or course of husbandry is applicable to every situation. It was not because the four course was an alternation of corn and cattle crops that it succeeded, though that was itself a great improvement; nor because it produced regularity of system, though that is also of much importance. Nor was it owing to the mere treading of the land by the feet of the sheep, though to that much of the success of the system used to be attributed. It was because it was a step in the right direction, one of those groupings in the dark by which the man of mere practice occasionally finds the best path. Pursuing it without the guide of science, it soon began to fail and lead him astray. There was no virtue in the constant round of crops or regularity of practice to compensate the increased exhaustion occasioned by the sale of larger produce without an equivalent return of manure. It was because it so far fulfilled the principle of keeping the land dry, clean, and rich, that it was in any degree successful.

On a full recognition of that principle rests our future agricultural progress. The landlord and the farmer must both recognise it in their dealings with each other and with the land. Crops which do not pay the farmer do not suit his purpose, and to restrict him to the growth of such is both impolitic and absurd. His business is to grow the heaviest crops of the most remunerative kind his soil can be made to carry, and, within certain limits of climate which experience has now defined, the better he farms the more capable his land becomes of growing the higher qualities of grain, of supporting the most valuable breeds of stock, and of being readily adapted to the growth of any kind of agricultural produce which railway facilities or increasing population may render most remunerative. In this country the agricultural improver cannot stand still. If he tries to do so, he will soon fall into the list of obsolete men, being passed by eager competitors, willing to seize the current of events and turn them to their advantage. The four course, or any other course when it has served its time, must expand itself to meet the increasing requirements of the day, by appropriating to itself the simultaneously enlarging resources of modern science and enterprise.

This naturally brings us to the statement of a question which we have considered and discussed with intelligent practical farmers in all parts of England—security for the capital of the farmer, whether under the designation of "Compensation for unexhausted Improvements," or, more briefly, "Tenant-right." A tenant investing capital in land seldom contemplates an immediate return. He does not anticipate that a large expenditure in cleaning and enriching worn-out land will be all repaid to him in the first crop. He lays the foundation for a series of good crops, which in the aggregate he expects to repay him with interest. If he drains, makes fences, or other improvements of a more permanent character.

a still longer period is requisite to compensate him. But he must either be secured in the possession of his farm for a certain period, sufficiently long to enable him to receive the benefits of his investment, or have some precise agreement under which he is to be repaid, in fixed proportions, for his outlay, if his landlord should see fit to resume possession of the farm. Without either the one or the other, an improving tenant has no legal security for the capital he invests in the cultivation of another person's land.

Yet the great proportion of English farms are held on yearly tenure, which may be terminated at any time by a six months' notice on either side. It is a system preferred by the landlord as enabling him to retain a greater control over the land, and acquiesced in by the tenants in consideration of easy rents. During a period of high prices moderate rents could be paid without the investment of much capital by the tenant; but low prices and universal competition compel agricultural improvement. We must either farm as well as our neighbours, or be undersold by them. The investment of tenants' capital, whether in money, skill, or industry, is now, therefore, more than ever necessary to success. It may be said, with perfect truth, that great agricultural improvements have been made and the most entire confidence subsists between landlord and tenant under this uncertain tenure. That tenants do, in many instances, invest their capital largely with no other security than their landlord's character, we most willingly testify; and the confidence which subsists between the two classes in England, generally, is in the highest degree honourable to both. In no country, perhaps, in the world does the character of any class of men for fair and generous dealing stand higher than that of the great body of English landlords. Yet there are exceptions, and these are unfortunately becoming more numerous. The son does not always inherit the virtues of his father. Necessity or education may make his views different. Family provisions and allowances may leave him less to spend from the same rental. The tenant, too, mixing more with the world than he used to do, or being educated at a more advanced period of its progress, begins to dislike the dependence implied in this relation. He knows that he must invest his capital more freely than heretofore in the cultivation of his farm, and in these days of change he feels that he is entitled to ask some effective security for its repayment. That security he may obtain, either by being guaranteed by lease in the possession of his farm for such a number of years as will give time for his invested capital to have full effect and be returned to him, or, if the landlord declines to give a lease, by an agreement on a certain basis for compensation for unexhausted improvements when either party wishes to terminate the connection. One or other of these alternatives the improving farmer is fairly entitled to expect; and for the reasons now to be given we most strongly recommend the general adoption of leases in preference to tenant-right.

The only counties in which the custom of tenant-right is fully recognised are Surrey, Sussex, the Weald of Kent, Lincoln, North Notts, and part of the West Riding. In these counties the custom has

been so long in operation as to have become binding in law, and they afford us an opportunity of judging whether the system has worked so well in practice as to justify its extension to all the other counties of England. In each of these counties, except the Weald of Kent, which we apprehend to be much the same as the contiguous tract in Surrey and Sussex, we minutely examined the state of agriculture, and the relations subsisting between landlord and tenant, as affected by this legalised custom, and our impression of each in its place, without reference to the other, was narrated in our former letters. In the wealds of Surrey and Sussex, where the custom is most stringent, we found the state of agriculture extremely backward, the produce much below the average of England, the tenants deeply embarrassed, and the landlords receiving their low rents irregularly; in fact, no men connected with the land thriving except the appraisers, who were in constant requisition to settle the disputed claims of outgoing and entering tenants. We found both farmers and landlords complaining that the system led to much fraud and chicanery, and that an entering tenant was compelled by it to pay as much for bad as for good farming; that intelligent farmers were most desirous that their landlords should buy up the tenant right, and thus put an end to it, and landlords in many cases were doing so. In Lincolnshire and North Notts we found the great improvement of agriculture of late years attributed to the system of compensation to outgoing tenants; yet, on examining the state of agriculture itself, it seemed to us, if not inferior, certainly in no respect superior to the proficiency of the same class of farmers in West Norfolk, whose capital is not protected by any compensation agreements, but by a 21 years' lease. The indefiniteness of the "custom" was also much complained of, and its constant liability to increase. Frauds were beginning to creep into the system, and landlords, for their own protection, were obliged to limit and define the custom by special agreement. In the southern portion of the West Riding, where tenant-right is very stringent, it is found to lead to great fraud and abuse, there being instances of "smart" men who make it their business to take a farm, hold it for a year or two, and by "working up to a quitting," as it is termed in Surrey, make a considerable profit by the difference which their ingenuity and that of their appraiser enables them to demand when they leave, as compared with what they paid at their entry. Obsolete practices are valued under this system at their original cost, so that the plan of giving five furrows to a light soil, in preparation for turnips, is perpetuated and must be paid for, though under the modern system two furrows on such land at the proper season are known to be not merely more economical, but really more beneficial.

The amount of these valuations varies between £3 and £5 an acre. A tenant entering to a farm is thus obliged to pay over a large sum to his predecessor, for operations in the direction and execution of which he has had no voice. There can be no doubt whatever that any man would prefer to spend his own money in making improvements according to his own judgment; but the advance of so much capital, over and above the ordinary stock

of the farm, either requires tenants of more than the means of ordinary farmers, or throws the land into the hands of men who, having expended the larger portion of their ready money in paying for their entry, are so hampered during their tenancy as to be unable to do justice to their farms. It is also obvious—for we are bound to look at the question as it affects both parties—that such a system offers great facility for combination by the tenants against their landlord. The owner of say 1,000 acres in such a district might find it very difficult to refuse the demands of his tenants, however unjust, if during a period of agricultural depression they offered him the alternative of getting his farms thrown on his hands, with a tenant-right to be paid down amounting to four or five years' rental.

Without going further into the question, it must be plain that it is not the interest of the landlords, if the decision is left with them, to adopt this system. To legalize it by act of parliament, so as to render its operation general over the kingdom, it would be necessary to prove that it would promote the public welfare. We have seen in the counties where it exists that the agriculture is on the whole inferior to that of other districts, and in no case, even under the most favourable circumstances, superior to other well-conditioned counties which do not possess this tenant-right. In every county it has led to fraud in a greater or less degree. It perpetuates bad husbandry, by stereotyping costly practices which modern improvements have rendered obsolete. It absorbs the capital of the entering tenant, thus limiting his means for future improvement. It unfairly depresses the letting value of land. Perhaps it may be urged that we dwell on the abuses rather than on the fair and legitimate uses of the system. But it is not easy to see where the line of demarcation is to be drawn. The difficulty has already occurred in Lincolnshire, where landlords find it necessary to limit by special agreement the otherwise indefinite and constantly widening objects which this custom may be understood to embrace. With the best and purest intention, a farmer may lay out £1,000 in drainage or manures; but if his investment turns our disadvantageous, is it consistent with common sense that he is to be at liberty to relieve himself from the consequences of his own miscalculations or imprudence by giving up his farm and demanding reimbursement of the "unexhausted improvement" from his landlord? The same principle, too, which is applicable to the farmer in his buildings and his farm might be equally claimed by the labourer in his cottage, his garden, and his allotment.

The practical working of tenant-right has led us to the conviction (contrary, we admit, to our preconceived opinions) that it is not desirable to extend it, either legally or conventionally, to other parts of the kingdom. However well it may look in theory, we should find the honest and intelligent farmers of other counties becoming disgusted with its frauds, and, as the same class are now doing in Surrey, North Notts, and the West Riding, demanding its restriction, and recommending their landlords to buy it up and get rid of it.

The wish for leases will increase when the tenant at will discovers that security for his capital by tenant-right is neither possible nor desirable. There

is a very prevalent dislike to leases on the part of the tenantry of England. To a considerable extent this was occasioned by the uncertainty of the maintenance of protection previous to the free-trade measures, but chiefly from the fact that there was really less change of tenancy and a lower scale of rent under a system of yearly tenure than under lease. If a man improved his farm during a lease, he was obliged to pay an increased rent for it, in consequence of that improvement, when he renewed it for a second term. If he held from year to year, he either made no improvement, or, speaking generally, so little that the difference of produce from year to year was so gradual and imperceptible that he kept nearly the whole advantage to himself. In the one case there was a gradual progress, caused by a greater exertion on the part of the tenant and a larger outlay by the landlord, in the advantage of which all parties participated; in the other an encouragement to maintain things as they are, that there might be no inducement on the part of the landlord to raise the rent. But there are instances in many counties, and particularly in the north and west, of the tenant's unassisted improvements

during a lease having been taken very unfair advantage of at its conclusion. The landlord's right of preference under the law of distress has been repeatedly urged to us as affording an embarrassed or inconsiderate landlord great facility in thus oppressing an improving tenant. In Northumberland we have given examples which prove in the strongest manner that the injury sustained by the tenants by being induced, through unfair competition, to offer exorbitant rents, never fails to reach the landlord in the prostration of that class whose means have been thus crippled, and who are compelled to resign their farms, which are then relet at greatly diminished rents. But a landlord with ordinary foresight must see that his interest is bound up in the permanent improvement of his estate, not in a temporary and, therefore, uncertain rise of rent. It is both his duty and his interest to encourage sure and steady progress; and we have no hesitation in saying that, in that respect, the system of yearly tenure has proved itself in practice, as it is in theory, inferior to that of leases with liberal covenants, when fairly and judiciously tried, as in the examples we have given at Holkham and at Woburn.

#### COMPENSATION COURT.—STRATFORD, MARCH 30.

(Before T. M. Gepp, Esq., Deputy-Sheriff, G. W. Bramwell, Esq., Q.C., Assessor, and a Special Jury.)

##### RAPHAEL AND THE VICTORIA LONDON DOCK COMPANY.

This was an inquiry to assess the amount of compensation which the claimant was entitled to receive from the above company for 101 acres 1 rood and 1 perch of marsh land at East Ham, which they required for the construction of their docks; and also to ascertain the damage the claimant would sustain by the severance of such land from his adjoining property.

The claimant, Edward Raphael, Esq., resides at Ditton Lodge, Surrey, and is the nephew of Alexander Raphael, Esq., formerly Sheriff of the City of London, from whom he inherited the property. The family name is also familiar to the public, in consequence of a gift of £10,000 to Cardinal Wiseman, and an intended donation of £60,000 to the Catholic Church, but which was not completed upon the death of Mr. Raphael. The proceedings excited the greatest interest among the gentry and farmers residing in the neighbourhood, and the jury, after meeting at the Swan Inn, Stratford, adjourned, upon their return from viewing the property, to the Assembly-room of the Yorkshire Grey Hotel, which is a more commodious building.

Mr. Serjeant Channell, with Mr. Tindal Atkinson, instructed by Messrs. Bell, Steward, and Lloyd, solicitors, of Lincoln's-Inn-Fields, appeared for the Claimant; and the Attorney-General, with Mr. Bovil, instructed by Messrs. Burchall and Parson, of Parliament-street, for the Company.

Mr. Serjeant CHANNELL observed, that he had the honour of appearing before them on behalf of the claimant, Mr. Edward Raphael, who was the owner of considerable marsh lands in the parish of East Ham, and 101 acres of which were required by the Victoria Dock Company. It appeared that the company obtained their

act in 1850, and Mr. Raphael, the claimant, succeeded some two years ago to some land which belonged to his uncle, Mr. Alexander Raphael, as heir at law; he was desirous of retaining possession of this property, being quite satisfied with its present value, of the increasing value of land in the neighbourhood, and of the ultimate advantages which most assuredly would accrue. The company, however, required the land in order to carry out their project. He had read their Act of Parliament, and it appeared to him to be very doubtful whether they had a right to take it against the will of the owner; and certainly if they could do so they would be exercising a very arbitrary power, which it would be well for the jury to narrowly watch. The land consisted of 101 acres 1 rood and 1 perch; and the whole of the land coloured red on the plan before the jury was the property of the claimant. The company did not propose to take the whole of it, but that portion on the south side of the deviation line, which would give rise to considerable injury by severance to the remaining portion. The land was of a very valuable character, and he doubted very much if they could find anywhere 200 acres of land equal to this in value, whether used for grazing purposes, or broken up and laid out in plots for market gardens, or other agricultural purposes. The land had been used by Mr. Raphael, the claimant, and his uncle for grazing purposes; but in estimating its value the jury were to consider not only its present productiveness, but what it would produce under the most favourable circumstances if its natural and local advantages were fully developed. There was a good hard road adjoining it, which led to the river, and the facilities of carriage both by land and water were highly advantageous. The land itself was of such excellent quality, that it enabled parties who

rented it to bring their cattle into good condition earlier than other graziers, and also gave them a command of the markets. They could send their cattle to Smithfield by an exceedingly easy drift, from its contiguity to the metropolis. If, therefore, he looked at this land simply for the purposes to which it was at present applied, he entertained no doubt that he should be able to satisfy them that it was land of a very extraordinary value. They would, no doubt, be told that the company were about to construct certain docks, of considerable public utility; but it was not because the undertaking proposed by them was one of a public character that the jury were to be at all chary in dealing out to the claimant, whose land was to be taken from him against his will, full, liberal, and ample compensation. The object of the company was not merely to construct docks, but they were striving to take away the livelihood of other persons. They took powers under their act to import foreign cattle; and they said they would take the graziers' lands, preserve their occupations, and secure to themselves all the advantages arising from such avocations in future. He would say that it was a most extended power, and was a power which it was the duty of the jury to watch with jealousy. He could not understand upon what principle—if there was any principle at all in such a proceeding—that the company could compulsorily take from this gentleman his land. The land they proposed to take did not adjoin their docks, but was some distance from them; and therefore he doubted whether they had the power to take it. He trusted that the company would call witnesses, who would tell the jury the description and quality of this land, what had been given for similar land in the same locality, and what it had been sold for. If this property was regarded as merely grazing land, the claimant would be entitled to receive a very large sum; but that was not the limit of his claim. The neighbourhood of late years had been very much altered—the Land Improvement Company had purchased considerable lands fronting the river, bringing a connection with the Woolwich Docks, Arsenal, and the town of Woolwich. Factories were being built, and a number of houses in the course of erection, and this land presented capabilities of a most important description. If it was retained for grazing purposes its value would be very much improved in consequence of the diminution of land by the construction of the docks and the railway, and the buildings that were going on. He understood that it would fetch £5 per acre for grazing purposes, and that if it was broken up and applied to market-gardening it would produce a much larger rental. The soil was of an alluvial kind, and it was not for the company to say that, because the late Mr. Raphael, who was rolling in wealth, had used it for grazing purposes only, that they were merely bound to give compensation for it as agricultural land. He should further show that the land contained a quantity of brick earth, and that there were facilities in this neighbourhood for carrying on extensive building operations, and no sooner was a house built than it was taken. He would show that the brick earth was five or six feet in depth, and that sand, breeze, and other materials necessary for making bricks could be obtained at a small cost. He requested the jury to apply their minds to the improvements of the past to guide them as to the value of this land in future. He would show them the amount of royalty and of surface rental that could be obtained for building purposes, and it would be that amount the claimant would be entitled to receive, including the compensation for severance. At present he had a right of way over the Manor-road to his upper lands, but when the company took possession of

the 101 acres, his right of way from his lower to his upper lands would be destroyed; and the present access being cut off, he would be compelled to go a distance of two miles and more round to reach his upper lands; and he defied the Attorney-General to show that the severance would not inflict considerable injury. The land which the company proposed to take was the lower plot on the river-side of the line of deviation south of the Thames; and, under all the circumstances, he had no doubt he should be able to show the jury that Mr. Raphael was fairly entitled to receive the sum of £43,000 from the company for the land which was demanded of him.

MR. JOHN CROUCH, of Parliament-street, Westminster, and Cirencester, Gloucestershire, examined.—I am land-agent for the Earl of Eldon, and for Mr. Peacock, the member for Harwich. I am also the partner of the surveyor to Earl Jersey. I have been engaged for sixteen years in surveying. I have gone carefully over Mr. Raphael's land, and made an estimate of its value for agricultural purposes. I find the gross quantity required by the company is 101 acres 1 rood 1 perch, from which I have deducted for waste 3 acres 1 rood 1 perch, leaving a nett quantity of 98 acres of exceedingly rich grazing land, which I have valued at 85s. per acre. In arriving at that, I have deducted the tithes and other charges. I take it at 33 years' purchase, which gives £13,744 10s. I next take for compulsory sale 50 per cent., and that amounts to £6,872 5s. I claim, in addition for severance from the 61 acres of the upper plot of land, £739 4s. I find that the land contains brick-earth to a very considerable extent—I may say, large extent—and I take the value at £25,806. I suppose that there is sufficient brick-earth to make 13 millions and a-half of bricks for 28 years annually, which, at a royalty of 2s. 3d. per 1,000, will amount to £1,518 per annum. The present value in money I take to be £25,806. I take the total of bricks that can be made to be 379 and a half millions, which gives £47,161 19s. for the four items. From that total I deduct, for loss of land consumed, and for contingent expenses, £7,450, making a nett sum of £39,711 19s. The reason I have added 50 per cent. for compulsory sale is in consequence of everything in the locality indicating a prospective increasing value. I find railways being constructed, factories being built, a number of houses already built or in progress close at hand, good road and river-communication; the land itself very available for building purposes, building-allotments laid out, and everything which indicates to my mind an increasing prospective value.

Cross-examined: I have not been accustomed to value land in this immediate neighbourhood before; but I have valued land ten or twelve miles off, in Surrey, on the other side of the water. I have also valued land at Chelmsford. The land I valued in Surrey was 300 acres in extent. I never valued marsh-land before. I do not know what this land is rented at. I did not inquire, because the amount of rent paid is not a criterion of its value. I have ascertained the rentals of other land in the neighbourhood; but that was after my valuation was made. Messrs. Bell, Steward, and Lloyd employed me to go over these lands. The result of my experience is that more than thirty years' purchase is what surveyors usually ask. I have known more than thirty-three years' purchase asked.

THE ATTORNEY-GENERAL: And given?

WITNESS: Ah! that is another question. (A laugh.)

THE ATTORNEY-GENERAL: I believe it is your practice to ask the highest price, and buy at the lowest?

Cross-examination continued: Fifty per cent. for compul-

sory sale is not the tip-top price that I have known to be asked. I have not enquired as to whether this land is let to several parties. I find that great damage will arise from severance in this way. Mr. Raphael kept a bailiff, who could pass from one field to the other while superintending the grazing. There is a farm-building on the land. It is more than a hut. There is a room in it fitted up for the accommodation of Mr. Raphael.

**THE ATTORNEY-GENERAL:** Do I understand you that your calculation is based upon the hypothesis that this earth is capable of making good bricks?

**Witness:** I am not a brick-maker; but I have examined the earth, and my opinion has been confirmed by others—that it is capable of making good bricks. I do not think 2s. 3d. is a high value to put the royalty at. I have heard that the royalty paid at Cowley is 3s., and that in the neighbourhood of Croydon is 2s. 4d. I observed some buildings of a superior character near the railway terminus. I did not observe more than two factories. I do not know the whole extent of the marshes. I will not undertake to say that there are not thousands of acres of brick-earth. In putting my estimate of rental at £4 5s. per acre per annum, I took into consideration that there is grass here both earlier and later than on other land.

**THE ATTORNEY-GENERAL:** Why, are you aware that it is under water for six months in the year? (Much laughter.)

**Witness:** I do not know that.

**Re-examined:** The building which has been facetiously called a hut is a brick building.

**THE ASSESSOR:** I believe we have seen it, and therefore you may leave the witness here. I thought it was a very good farm house.

**By the ASSESSOR:** The quantity of brick earth which might be obtained regulates my estimate of its value. I suppose the quantity of supply would regulate the price. I know, from report, that the whole of the land from here to Southend is not of the same description as this, and contains brick-earth. It is upon the demand I have regulated the price, but I cannot tell you the quantity that would be here required.

**THE ASSESSOR:** Then you know nothing about it. Why do you conceive this to be the royalty at all?

**Witness:** Because I consider it is a low royalty.

What has the compulsory sale to do with the increased value of the land in the neighbourhood? I put 50 per cent. on the value of the land for compulsory sale in consequence of its prospective improvement.

Do you think all these marshes have improved 50 per cent?—No.

Then why has this?—Because of its situation.

**By the ASSESSOR:** I have only estimated that it contains 50 acres of brick earth.

**By the ATTORNEY-GENERAL:** I do not think that the land will be less adapted for building purposes after five or six feet of brick-earth has been taken away. I think parties might build without filling it in. I believe the present level is ten feet below high-water mark, and I am told that low-water mark is eighteen or twenty feet under the surface of the land.

**MR. THOMAS EVANS** examined: I have been engaged for many years as a practical farmer, and have occupied a considerable portion of land on my own account for agricultural pursuits. I have been engaged all my life in agriculture. I was agent for the late Messrs. Raphael between twenty and thirty years

and have superintended the management of their land since 1814, when he became possessed of it. Since his death I have acted for the present Mr. Raphael, the claimant. He has altogether 202 acres. I know the road called the Manor-road, which leads from East Ham down to the river. There is access from the Manor-road to one portion of the land, and a right of way to the other across the field between. The land the company proposes to take is on the south side of the deviation line. The part to the north, which consists of 64 acres, is to be left, and the only road to approach it will be a very circuitous one. The present distance from one field to the other is about 200 yards, and in the future it will be above two miles, as they must go round by the Barking road. This land was purchased in 1814 by Alexander Raphael, and by agreement Mr. Lewis Raphael took the whole of the property from his brother, allowing him 3 per cent. on the purchase. I bought the stock, and acted for them. The upper portion was occasionally let off. Mr. Lewis Raphael has been dead about 12 months, and it is now let to four tenants—Mr. Daniel Maidwell 64 acres: he is a cattle salesman, and pays £234 per year; Mr. Joseph Goodchild 66 acres, for which he pays £288 15s., minus £47 10s. rates; the third tenant is Mr. Joseph Gardiner, of Whitechapel, meat salesman, who gives £77 per year for 28 acres: that is the very worst part of the land, as it is near the reed shore: he pays rates and every thing. Mr. Thomas Simons, butcher, of Leadenhall-market, rents the fourth piece of 14 acres, for which he pays £49 10s. per year, and all rates and taxes. I have found this land the best I was ever connected with for grazing purposes. I have known the land for 20 years, and never during that period known it to be under water. There are horses now on Goodchild's land that have been there all the winter. There is a great advantage in being able to fatten cattle during the winter. Great advantages also arise in this way: The supply to Smithfield may always be ascertained on Sunday, and it was my practice to send down for any quantity required. The expense of sending the cattle up was trifling, the drift being short, and I was able to watch the turn of the market, and take advantage either of shortness of supply or of high prices. The land has been let at from 3 to 5 guineas an acre, and therefore I have taken it on an average of 4 guineas. I have had more than 5 guineas for it in one or two instances, but not latterly. I will not mislead the jury; in those cases we have paid the rates. They amount to 16s. 6½d. per acre upon the whole of the land. This has always been considered the best land in the neighbourhood for grazing purposes. I have known many instances of grass-land being broken up and applied to general agricultural purposes. I have often recommended the old gentleman (Mr. A. Raphael) to break up this land, but he had an insuperable objection to it. I have also recommended the present Mr. Raphael to do so; but he says, "Let us see first whether the docks will come or not, and then we will appropriate this estate." The elder Mr. Raphael would not break up this land if you had given him £1,000 per acre to do so. He was a very rich man, and had his eccentricities, and like such men he indulged in them. This land, if broken up, would fetch from £8 to £10 per acre as market-gardens, and would easily let. There is no land like it for market-gardens. I should describe it as an alluvial soil, which has been accumulating for many ages, and containing saline and other deposits, and it is a particular kind of land, that is much sought after. It is very advantageous for market-gardens, as it abuts on a



very good road, and there is also access to it by the river; the produce could, therefore, be conveyed to market either by the water or the road, but the water conveyance would be preferable, as it would be the cheapest. I have received a letter from the agent of the North Woolwich Land Company, making me an offer to dispose of this land for building purposes; and there is land now allotted out for building in the neighbourhood. I have not observed that any houses are to let. I have tested the earth, and find that under the sub-stratum of brick earth there is a considerable portion of sand. I consider that as market-garden ground it is worth £8 per acre. I value it at that rate at thirty-three years' purchase, and I should be very glad to invest a large sum of money for Mr. Raphael on land similar to this.

Cross-examined.—Mr. Alexander Raphael died about two years ago; and the present occupier then came into possession as heir-at-law, his uncle having died without a will. Mr. A. Raphael purchased it in 1844, by private contract, for £120 per acre. The rents at that time were higher than at present, in consequence of the depreciation of agricultural land generally. In 1844 I let 20 acres for £95, Mr. Raphael paying the rates, and 24 acres for £126. The 66 acres let to Mr. Goodchild fetch £4 7s. 6d. per acre, and we pay the rates. Mr. Edward Raphael inherited the whole of his uncle's property at his death. There was no partition except about 2,000 acres in Kent, which Mr. Lewis Raphael—the other uncle, who has since died—shared with him under the law of gavel-kind, which prevails in that county. Mr. Raphael bought in July last, by public auction, 18 acres of marsh land, and paid £150 per acre for it; and it is now let at £150 per acre to Mr. John French, of Plaistow, sheep salesman. It was not then known that the Dock Company were coming here. The company have been acting most cunningly (laughter); they have been pouncing upon every bit of land they could for the last five years.

The ATTORNEY-GENERAL.—Now take care. They have only had their act since 1850.

Witness.—They began before they got their act. I am speaking of the Land Company.

The ATTORNEY-GENERAL.—Oh, but we are speaking today of the Dock Company.

Witness.—They are the same.

The ATTORNEY-GENERAL.—Be careful, sir. I will prove before this inquiry is over that you are speaking that which is false. Will you pledge your oath that they are the same?

Witness.—I only know that the same agents and the same persons came to me to make me offers for the land.

The ATTORNEY-GENERAL.—What is the name?

Witness.—Mr. Witticomb.

Cross-examination continued.—There is a public road to the river by the side of the land in question. I am not speaking of the value of this land merely as market-garden ground; but for the purpose of growing roots and other valuable produce. I believe that since such large quantities of garden ground round the metropolis have been taken for public works and buildings, the value of land for market-gardening has been largely enhanced. I know one man who has been driven out of his occupation three times from Hackney to Bow; and now that he was just cultivating a bit of marsh near Mr. Raphael's, the Dock Company had served him with notice that they required it. His name is Highbury. I cannot say whether or not he broke up the ground since the notice was served on him, in order to make a claim upon the company.

The ASSESSOR.—Do you know any land between Bow

Creek and Barking Creek similar in quality and quantity to this, which has been converted into market-gardens?

Witness.—Yes, I do. Mr. Matthews, of Barking marshes.

Has it been successful?—Yes.

By the ASSESSOR.—I know many hundreds of acres of marsh land, that have been cultivated as market-gardens at Hornchurch, Rainham, Dagenham, Grays, West Thurrock, and other places in this county. They have brought immense crops of corn and potatoes for twenty or thirty years without manure, and I reasonably calculate, I think, that this will be productive as land for agricultural purposes to grow roots, turnips, potatoes, wurzel, swedes, and other plants.

The ASSESSOR.—And, using it for that, is it worth £8 per acre?

Witness.—Oh, certainly. A person would not hesitate, I should think, to give £8 per acre, who can farm the land for twenty or thirty years without using any manure.

Mr. THOMAS MATTHEWS examined.—I reside at East Ham, and have been a farmer and market gardener for twenty years. I farm 450 acres of upland, 400 of meadow land, and from seventy to eighty acres of marsh land. I have been over Mr. Raphael's land. I occupy land in the immediate neighbourhood. I have no doubt Mr. Raphael's land would be applicable for the purposes of market gardening. My opinion is that it is worth £5 per acre for a long term of years because it would not require manure. It might be applied to growing wheat, oats, turnips, potatoes, and other things. It would as grazing land graze three beasts and four sheep on every two acres. I have grazed as many as that on land in my own occupation, which is not so good as this. I cannot get land on lease in this level since there have been so many schemes of docks and rails and land companies afloat (a laugh).

Cross-examined.—The abstraction of 800 acres of marsh by the Dock Company will not improve the remaining portion of Mr. Raphael's property. The value of land has decreased of late, as grazing land, from 10s. to 8s. per acre, chiefly in consequence of the importation of foreign cattle. I broke up twelve acres into market land about six years ago, and about six acres about three years ago. The ordinary rent of marsh land is from £2 15s. to £3 5s. per acre. Miss Pearce lets above 100 acres at £4 per acre. That was let about eight or nine years ago, the tenant paying the rates.

The ASSESSOR.—Taking good upland and good marsh land, which produces most?

Witness.—My own impression is that marsh land produces most. If you take the 5,000 acres of marsh land in the level of East Ham and Barking, and if you take the 2,000 acres of upland in the parish of East Ham, you will find that the marsh land produces the highest rate. There are many acres of upland between this and Barking which have been broken up for market gardens, although the occupiers have the marshes lying below them, and have seen them for many years, and yet not broken them up.

Re-examined.—There has been an increase in the price of meat during the last year, in the face of the importation of foreign cattle. The value of this land is greatly enhanced in consequence of not requiring manure, which is expensive, from the cost of carriage. Every load of manure put upon my land costs me £1.

The ASSESSOR.—Do you think that this ground is more advantageous for building upon than the Isle of Dogs? Yes. Why do you think so?

Because the air is more salubrious (a laugh).

The Assessor.—I perceive you are an inhabitant of East Ham? Yes (renewed laughter).

Mr. WILLIAM BOARDS, of Edmonton, farmer, examined.—I have been acquainted with the London markets for the last thirty-five years. I went over for the purpose of looking at Mr. Raphael's land, and I value the gross rental at £5 10s. per acre; that would include the charges payable by the tenant, the landlord paying the rates. I put that value upon it for grazing purposes. Looking at it for market-gardens and agricultural purposes, I should put the gross rental at £8 per acre, the landlord paying the rates.

Cross-examined.—I have made no inquiry what other persons are paying in the neighbourhood.

A WITNESS proved the circuitous route which would have to be taken by the claimant in order to reach his upper lands after the severance of this land, and which was not disputed by the company.

Mr. THOMAS COLSONN sworn.—I have been a brick-

maker for the last thirty-five years, and reside at Highgate. The usual surface-rent for brick-making is £5 per acre, with a royalty of 2s. 6d. per 1,000. The brick-earth on this land is 6 feet deep and 9,680 cubic yards in extent, which is capable of being made into 4,810,000 of bricks, and would produce £605 per annum.

At this stage of the proceedings, after it had been arranged to adjourn the inquiry until the following morning, the Attorney-General quitted the room, but returned in a few minutes and announced that he was happy to say that the jury would be spared any further time and trouble, as the parties had agreed that the amount which the company should pay the claimant should be £20,000, viz., £19,250 for the value of the 10½ A. 1r. and 1p. of land, and £750 for the injury sustained by severance.

The verdict of the jury having been formally taken for that amount, the proceedings terminated.

## IMPORTANT DECISION TO CATTLE DEALERS.

### NORTHAMPTON COUNTY COURT.

(Before J. W. Wing, Esq.)

WATTS v. THE LONDON AND NORTH WESTERN RAILWAY COMPANY.

This was an action to recover the value of a beast which was alleged to have been killed by the negligence of the plaintiffs. The case was tried before the following jury:—

Mr. Charles Thomas Small, Hardingstone.

Mr. John Rice, Dallington.

Mr. Charles King, St. James's-end, Duston.

Mr. F. Underwood, Hardingstone.

Mr. T. HOWES was for the prosecution, and Mr. GIFFARD, barrister-at-law, for the defence.

Mr. HOWES opened the case. The action, he said, was brought to recover the sum of £11, a loss sustained by the plaintiff in consequence of a beast which had been sent by the defendants' railway having been killed through the negligence of the defendants' servants. On the 27th of November, the plaintiff forwarded a number of cattle by train from Roade to London. At Tring the drover who had them in charge observed that one of them was down, and after several ineffectual attempts to raise it, he told the guard that the truck must come off. The guard, however, proceeded on to Watford, and when the train arrived there the animal was dead, or so nearly so that it was found expedient to cut its throat. Mr. Howes having, at some length, enlarged upon the duty of the railway in respect of its traffic, called the following witnesses in support of his case:—

J. ROGERS: I am a drover for Mr. Watts. On Saturday, the 27th of November, I went with some beasts to London. When we got to Tring I observed that a bullock was down, and two others were a-top of it. I and the guard tried to get it up, but not succeeding, I told the guard I would have the truck unhooked. The guard said I must go back to the station-master. I went back on one side of the train, and I expected the guard was going on the other, but when I had got about twenty yards I turned my head, and saw the train going on. The guard had the green flag in his hand, which is the signal for going on. I ran forward, and contrived to get into the

break. When we got to Watford the bullock was dead. We cut its throat to make the most of it.

By Mr. GIFFARD: I have been three years in Mr. Watts's employ, and have taken cattle by train every week. I took no ticket; the clerk always sends it on by the guard. I cannot write.

SAMUEL KING: I am a salesman, and was on the train on the day in question. I heard Rogers desire the truck to be unloaded. I saw the beast down, and consider that it ought to have been unloaded. I have had cattle taken off when they were down.

By Mr. GIFFARD: Not at Tring. I never had a beast down at Tring. It was at Weedon, after loading at Crick.

By Mr. HOWES: The guard said there was an up and down train due. The up train came about ten minutes after we had got to Watford.

Mr. WATTS, the owner, stated that the dead beast fetched £14; it would have fetched £25 if it had reached London alive.

By Mr. GIFFARD: I have heard the terms upon which cattle are sent. I have heard they were carried at the risk of the owner, the company using every precaution; but that they were not at our risk when there was negligence on the part of the company's servants. I never read the conditions. I never heard the guard had the ticket. I never saw a ticket myself. I used to sign the book, but I never read it. The counterfoils produced are signed by myself.

This was the case.

Mr. GIFFARD then opened the case for the defence. The learned gentleman stated that at common law a carrier was liable for the security of the articles he undertook to carry, under whatever circumstances, and he therefore was in the habit of charging rates of insurance rather than of carriage. But this liability might be modified by special contract, and a ticket-book which he should produce would show that for three years

the plaintiff had constantly been affixing his signature to tickets to which there was appended the contract conditions under which the company undertook the carriage of cattle. These conditions were, that the company should be exempt from all liability arising from the risk of loading or unloading, from the cattle being suffocated or trampled upon, &c.; the charge of conveyance being for the use of the waggon and the locomotive, and not for insurance; that the cattle should be in the care of a drover, who should for that purpose travel free, and who should see for himself that the carriages were in a sufficient condition before they started. The particular ticket referring to this transaction was not, it was true, signed by the plaintiff; but that was because of a departure from the custom which had originated in the convenience of the plaintiff himself, who employed a man who was unable to read and write. The defendants being under a special contract, would not, therefore, be liable, excepting on proof of gross, almost amounting to wilful, negligence. Now, what were the facts? When the train arrived at Tring the beast was discovered to be down; there was no cattle landing on the up line, and some delay took place in the endeavour to get the animal up—an endeavour which the guard assisted, although he was not bound to do so, the cattle being in charge of the drover. The only question was, whether it was better to go on to Watford, or to wait till the trains on the down line would enable them to cross, at the risk of being run into by other trains which might in the interim become due. It had been thought better to go on, a decision which was strengthened by the opinion of a passenger who himself had charge of cattle, and was accustomed to travel with them. But suppose an error of judgment had been committed. That was not gross negligence, the proof of which was requisite to render the company liable. But he could not admit that there had ever been any such error of judgment. Could they conceive anything more likely to cause an accident than an attempt, on the duration of which it was impossible to calculate, either to unload on the line where there was no cattle siding, or to wait till the down line was clear? What would have been said, if that course having been followed, a passenger train had run into the cattle train, and loss of life had ensued? Would it not have been declared to be monstrous that human life should have been risked under such circumstances, and that the first care of the company ought to be the safety of their passengers? The learned gentleman then called the following witnesses:—

**BLEMAIRE SHAW:** I am station-master at Roade. The ticket produced is the one given to the guard on the 26th of November.

**By Mr. HOWES:** It is not signed.

**JOHN THOMAS,** station-master at Bliworth, produced a book containing the signatures of the plaintiff.

**THOMAS HARRISON:** I am a salesman in Leicestershire, and am in the habit of travelling with cattle by train. I was in the train on the 27th of November, with Mr. Watts's man, Spriggs, and the guard. Mr. Watts's man came at Tring and said a beast was down. He asked the guard to unload it. The guard said there was no chance of unloading at present. There was a luggage-train on the down line, and an up-train expected every minute. The guard did all he could to get the beast up. It is next to impossible to get cattle out, except where there is a cattle siding. I have lost cattle myself in the same way. I have no interest in the company. Under all the circumstances of the case, I think it was not advisable to

attempt to unload at Tring. I said at the time they would get to Watford as soon as they could unload there.

**THOMAS BLOOMER:** I was breakman or guard to the 8.45 a.m. train from Rugby, on the 27th of November. We were detained at Tring rather more than ten minutes. I gave every assistance in my power to get the beast up. I saw no probability of unloading, in consequence of the down line being blocked up by two luggage-trains, and a passenger-train in the rear, and the cattle landing being on the down line. In my judgment the best course was to go on to Watford. There were several cattle-dealers there besides Mr. Watts's man. Several parties who had beasts down at the same time, said the best course was to go on to Watford. We went on as fast as we could. The up passenger-train passed us at Tring. That was the cause of our stopping at Tring.

**By his HONOUR:** We were from 30 to 35 minutes going from Tring to Watford. It would have taken us an hour, at least, to get across to the landing side at Tring, in consequence of the trains which blocked the down line.

This was the case for the defence.

**Mr. HOWES** contended that the negligence of the company had been proved by the defence itself. They could not get to the cattle siding because the down line was blocked by two luggage-trains and a passenger-train. What business had the line to be so blocked?

His Honour said there were two points for the consideration of the Jury; first, the terms upon which the carriage of the cattle had been undertaken by the railway; and secondly, the state of the facts which occasioned the death of the animal for which compensation was sought. It appeared that although the particular ticket relating to this journey had not been signed, similar tickets had very frequently been signed by the plaintiff. The Jury would consider whether, having previously signed tickets upon which the conditions which they had heard read were printed, the plaintiff continued to have his cattle conveyed under the conditions; or whether they were conveyed under the somewhat different understanding which the plaintiff had himself stated. The liability of carriers arose in two ways: as insurers, in which case they were liable at all hazards; and as bailees, in which case they would be liable for negligence. It was not contended in this case that the company were in the situation of insurers; that therefore was out of the consideration of the Jury. But then it was said they were liable as bailees, a liability which the learned counsel had told them was limited, and could only arise in the case of gross negligence. The Jury would have to say whether, if there was negligence, there was gross negligence. It appeared by the evidence of the guard that the going on to Watford was to be done, under the circumstances, in less time than the crossing to the cattle siding. Those circumstances were, that there were two goods trains and a passenger train on the down line. Now, Mr. Howes said that was gross negligence. It was for them to determine whether it was so. They would bear in mind that the company had not made a contract to land the cattle at Tring. Did the Jury think there was an obligation upon them to keep their line clear so as to enable them to get out a beast that might happen to be down on any part of the line? Mr. Howes seemed to think they were; but it seemed to him that such an obligation would almost put a stop to the carrying of cattle at all. Certainly it implied an amount of expense which would inevitably prevent their being carried at anything like the present rates. However, that was a question for the Jury. It was for them to say whether or not the company had done what any prudent man would have done in his own case. If they thought that if the company had been carrying cattle for themselves, they would have waited at Tring till they could get to the cattle siding, or would have taken care that the down line should never be blocked up, they would find for the plaintiff. If they did not think so—if they thought that the going on to Watford was the best course, or might reasonably be supposed by the guard to be the best course, they would find for the defendants.

The Jury, after a brief consultation, found for the defendants, and his Honour allowed costs.

STALLIONS FOR THE SEASON 1853.

Name.	Colour.	Age.	Pedigree.	Performances.	Principal Performances.	No. of winners out by.	Sire of	Standing at	Apply to	Price.
Alarno.....	bay	11	by Visonon, out of Southdown, by Defence.	started 17, won 13	won Ascot Cup	13	Frankie	Hampton Court.....	—	15 gs. (25 mares)
Almandale.....	brown	11	by Touchstone, out of Rebecca, by Lottery.	started 15, won 3	won second for Derby	3	Cotton Lady	Lane Padocks, Sheffield.....	F. Croft	10 gs.
Archy.....	bay	14	by Camel, out of Garcia, by Octavian	started 8, won 3	won £1000 at Newmarket	2	Arléto	—	—	5 gs., h. b. 2 gs.
Auctioneer.....	bay	17	by Pantaloon, out of Puff, by Waterloo.	never appeared.	—	—	—	Skinnigrove, &c.....	Mr. G. Allinson.	10 sovs.
Backbiter.....	brown	8	by Gladiator or Don John, out of Scandal, by Selim	started 24, won 5	won Goodwood Stakes.....	untried.	—	Dringhouses, York.....	Mr. J. Pearson.	—
Bay Middleton.....	bay	24	by Sultan, out of Colweb, by Phantom	started 7, won 7	won the Derby	97	Flying Dutchman	Daubury.....	—	20 gs. (30 mares)
Betram.....	chestnut	20	by Sultan, out of Miss Cantley, by Stamford.	started 17, won 3	won Drawing Room S.	17	Midas	Burdley, Stamford.....	Mr. H. Rose	10 sovs.
Birdcatcher, Irish.....	chestnut	20	by Sir Hercules, out of Guiccoli, by Bob Booty	started 15, won 6	won the Madribs	92	The Baron	Easby, Richmond, York.....	Mr. J. Jones	50 gs. (subs. full)
Birkenhead.....	brown	10	by Liverpool, out of Archib, by Filho-da-Puta	never appeared.	—	—	—	Redbury, St. Albans.....	Mr. G. Smith	£5 10s., h. b. £2 15s.
Bishop of Romford's Cob	bay	13	by Jereed, out of Jennina, by Count Porro.	started 61, won 26	won the Royal Hunt Cup	untried.	—	Chobwell, Tonnesh.....	Mr. Watson	5 sovs., h. b. £2 10s.
Black Dwarf.....	black	9	by Voltare, out of Yartico, by Waverley	started 1.....	—	untried.	Liberty	Plumpton, Knaresbro'.....	Mr. T. Groves	5 gs., h. b. 2 gs.
Black Prince.....	black	11	by Touchstone, out of Queen of Trumps, by Adolphe	started 1.....	—	1	—	Water Tower, Rugby.....	Mr. Walker	5 gs., h. b. £2 13s.
Blaze.....	brown	7	by John, out of Flambeau, by Turcoman.	started 13, won 4	won Hopeful Stakes	untried.	—	White Hart, Welwyn.....	Mr. Tredgett	5 gs., h. b. 2 gs.
Blonchroke.....	chestnut	6	by J. of Gaint, out of Squaque, by Crescent.	started 7, won 3	won the Peterborough S.	untried.	—	Winnarcket	—	5 sovs.
Bran.....	chestnut.	22	by Humphrey Clinker, out of Velvet, by Oiseau	started 8, won 6	won Swinley S.	27	Our Nell	Stidcom, Delenere T. Hoekbahl	—	5 gs., h. b. 3 gs.
Brighton.....	brown	19	by Brutandorf, out of Caroline, by Whisker	never appeared.	—	—	—	Great Peading, Leicestershire	Mr. Derby	5 gs., h. b. 2 gs.
Burgundy.....	bay	10	by Ismael, out of Caroline, by (Irish) Drone	started 24, won 13	won Kerton Manor Cup	1	Moselle	Rawcliffe-Stud-farm, Yk. T. Bateson	—	30 gs., h. b. 2 gs.
California (Bro chestnut to Riddlesworth),	chestnut	20	by Enluis, out of Filagree, by Soothsayer	never appeared.	—	4	May Day	Bushbury, Wolverhampton	J. Daley	5 gs., h. b. 3 gs.
Cameleopard.....	brown	11	by Giraffe, dam by Muley	started 13, won 3	won £250 at Preston.	untried.	—	Ramstead, Newbury.....	Mr. Hedge	5 gs., h. b. 2 gs.
Cantonite.....	bay	12	by Muley Moloch, out of Jubilee, by Cotton.	started 37, won 16	won Croxton Park Cup	untried.	—	Leckhampton, Cheltenham	Mr. J. Villars	5 gs., h. b. 2 gs.
Chanticleer.....	grey	10	by Irish Birdcatcher, out of Whim, by Drone.	started 33, won 21	won Doncaster Cup	untried.	—	Rawcliffe-farm, York.....	T. Bateson	12 gs. (50 mares)
Chatham.....	chestnut	14	by The Colonel, out of Hester, by Camel.	started 16, won 8	won the Criterion	12	Sittingbourne	Ham, Armold.....	—	20 gs. (15 mares)
Charles XI.....	brown	17	by Voltare, out of Vagtail, by Prime Minister	started 34, won 19	won St. Leger.....	19	The Swede	Stables, Bromyard	—	6j gs.
Census.....	brown	5	by Pompey, out of Iberia, by Physician	started 26, won 1	won £360 at Derby	untried.	—	Norwood, Yorkshre	Mr. Devereux	—
Collingwood.....	bay	10	by Sheet Anchor, out of Kalmia, by Magistrate	started 70, won 31	won the Royal Hunt Cup	untried.	—	Newmarket	Messrs. Barrow	12 gs. (40 mares)
Connaught Ranger	chestnut	9	by Harkaway, out of Guiccoli, Bob booty	started 32, won 4	won the Corinthians.....	untried.	—	Rawcliffe-farm, York.....	I. Bateson	5 gs., h. b. (half price)
Corporal, The.....	bay	4	by Orlando, out of Parade, by Pantaloon	never appeared.	—	—	—	Byer Hill, Stoke-on-Trent	Mr. Parby	10 gs.
Cossack.....	chestnut	9	by Helman Platoff, out of Joannina, by Priam	started 19, won 3	won the Derby	untried.	—	Stanton, Sheffield	Mr. Eyke	10 gs. (40 mares)
Cootherstone.....	bay	13	by Touchstone, out of Emma, by Whisker	started 11, won 7	won the Derby	32	—	Aldersley, Northampton	Mr. Elliott	25 gs. (20 mares)
Cootherstone, Yng.	bay	5	by Cootherstone, out of Lilla, by Bokadil	never appeared.	—	—	—	Audena, Nantwich	Mr. Lisle	5 gs., h. b. 3 gs.
Cowl.....	bay	11	by Bay Middleton, out of Crucifix, by Priam	started 8, won 6	won Buckenhara S.	6	Confessor	Althorp, Northampton.	Mr. Elliott	10 gs., h. b. 3 gs.
Cranebrook.....	chestnut	10	by Alcaston or Don John, out of Urganda, by Trossas	started 19, won 6	won the G. York Hand.	untried.	—	Northampton.....	Mr. S. Dickens	10 gs., h. b. 3 gs.
Croupier.....	bay	5	by Touchstone, out of Decoy, by Filho-da-Puta	started 11, won 4	won £160 at York Hand.	untried.	—	Bonehill-farm, Hamworth	—	8 sovs., h. b. 4 sovs.
Cure, The.....	brown	12	by Physician, out of Morsci, by Mulario	started 26, won 16	won the Claret	5	Laubton	Catterick	—	8 gs.
Deitrium.....	brown	22	by Filho-da-Puta, out of Lunatic, by Prime Minister	started 17, won 6	won a Royal Plate	5	Insanity	Croft, Durlington	Mr. C. Pylus	—
Don John.....	bay	18	by Trump or Waverley, dam by Comus	started 10, won 9	won St. Leger	47	Lady Evelyn	Willesden, Paddocks	J. Fielding	20 gs. (25 mares)
Dutinger.....	chestnut	17	by Rube, out of Devenary, by Waty	started 1.....	—	7	Duocet	Summer Town, Oxford	Mr. S. Beetzey	3 gs., h. b. 2 gs.
Ejrius.....	chestnut	19	by Leander, out of Olympian, by Sir Oliver	started 31, won 12	won Copeland Handicap	30	Pyrrhus the First	Waddinghall, Wiltshire	J. Bullock	10 gs. (40 mares)
E-sedarus.....	chestnut	7	by Gladiator, dam by Volopide	started 4, won 2	won Somerscliffe S.	untried.	—	Wetherby, Wharfedale	Mr. Jones	5 gs., h. b. 15 gs.
Fallow Buck.....	bay	8	by Visonon, out of Phogary, by Emilius	never appeared.	—	—	—	Wetherby, Wharfedale	Mr. W. Ayling	5 gs.
Falkstaff.....	brown	11	by Touchstone, out of Decoy, by Filho-da-Puta	started 3.....	—	1	Lily Colt	Stadrig, Kelso	—	5 gs.
Faugh-a-Ballagh.....	brown	12	by Sir Hercules, out of Guiccoli, by Bob Booty	started 4, won 11	won St. Leger.....	28	Ethelwolf	Dean's Hill, Stafford	Mr. Painter	12 gs.
Ferhill.....	bay	8	by Ascot, out of Arethusa, by Elis.	started 34, won 5	won Metropolitan Hand.	untried.	—	Wrayby, Brigg	Mr. J. Ashton	10gs., d. of winners 5gs.
Flatacatcher.....	bay	7	by Touchstone, out of Decoy, by Filho-da-Puta	started 26, won 16	won 2,000 Gs. Stakes	untried.	—	Oswaldkirk, Yorkshre.	R. Thorpe	5 gs.
Flying Dutchman.....	brown	8	by Bay Middleton, out of Barbel, by Sandbeck	started 16, won 13	won the Derby	untried.	—	Rawcliffe-farm, York.....	T. Bateson	80 sovs. (subs. full)
Footstool.....	bay	10	by The Saddler, out of Trudge, by Trump	started 24, won 13	won Swinley Stakes	untried.	—	Newmarket.	Messrs. Barrow	10 sovs.

Freedom.....	chessut	13	by Hart, out of Nell, by Blacklock	..... started 8, won 4	Richmond Haml.....	1	untried.	Liberty	.....	Stockton, Sc.....	W. Charlton	.....	5 gs., h. b. 2 gs.
Gabbler.....	bay	3	by B. Middleton, out of Flycatcher, by Goplin	..... started 14, won 3	£325 at Doncaster.	.....	.....	.....	.....	The Lodge-farm, Brackley	.....	.....	5 gs., h. b. 2 gs.
Gransby.....	brown	11	by Tomboy, out of Lady Moore Carew, by Sultan	..... never appeared	.....	.....	3	Trousseau	.....	Easy Abbey, Rich., York	R. M. Jaques, Esq.	.....	10 gs.
Gliffelt.....	chessut	9	by Pleasantry, out of Glendon, by Tomboy	..... started 4, won 3	won the Clearwell	.....	untried.	.....	.....	Doncaster	.....	.....	7 gs., h. b. 3 gs.
Goliath.....	brown	5	by Tonhstone, out of Collins, by Laugar	..... started 5,.....	.....	.....	untried.	.....	.....	Holcombe, Barn	Mr. Whitworth.....	.....	5 gs., h. b. 2 soys.
Grecian.....	chessut	5	by Epirus, out of Jeany Jumps, by Rovero	..... started 4, won 2	won July Stakes	.....	untried.	.....	.....	Theobald's Farm, Stockwell	Mr. S. Matthews.....	.....	5 soys.
Hernandez.....	brown	5	by Pantaloon, out of Black Bess, by Camel	..... started 17, won 7	won 2000 Guineas S.....	.....	untried.	.....	.....	Murton, York	Mr. Kirby	.....	10 gs. (40 mares)
Hero, The.....	chessut	10	by Chesterfield, out of Grace Darling, by De-fence	..... started 37, won 20	won Emperor's Plate	.....	untried.	.....	.....	Dancbury, Stockbridge.	Mr. J. Day	.....	10 gs.
Hippolytus.....	bay	5	by Emilius, out of Fantastic, by Touchstone	..... started 17, won 3	won Dec Stakes.....	.....	untried.	.....	.....	White House, Saltburn.	Mr. Andrew	.....	5 gs., h. b. 2 soys.
His Grace.....	bay	7	by Sir Hercules, dam by Deface	..... started 8, won 1	won Warwick Trial S.....	.....	untried.	.....	.....	Delaine Cottage, Hert-ford Station	Mr. J. Hughes	.....	3 gs., h. b. 2 gs.
Hofspar (h. b.).....	brown	4	by Don John, out of Scandal, by Selim	..... started 9, won 2	second for the Derby	.....	untried.	.....	.....	Allington, Devizes	Mr. J. Goodwin	.....	10 gs., h. b. 5 gs.
Ilago.....	brown	10	by the Doctor, out of Blue Bonnet, by Touchstone	..... started 18, won 10	ran second for St. Leger.	.....	6	Broughton	.....	Busby Paddock, Hamp-ton Court	.....	.....	15 gs.
John O'Sof.....	brown	9	by Helman Platoff, out of Welford, by Priamus	..... started 57, won 8	won the Kirwans	.....	untried.	.....	.....	Beverly	.....	.....	10 gs.
John O'Gunn.....	chessut	15	by Taurus, out of Mona, by Partizan	..... started 58, won 23	won Newmarket S.....	.....	5	Bollingbroke	.....	Leyhour, Maidstone.	Mr. Tweed	.....	10 gs.
Khan of Tartary.....	bay	9	by Bay Middleton, out of Mullana, by Mulvey	..... never appeared	.....	.....	untried.	.....	.....	Hoddesdon, Herts.....	Mr. H. Gibbins	.....	10 soys., h. b. 2 soys.
King of Oude.....	bay	6	by Small-hedges, out of Mustard, by Emilius	..... started 17, won 15	won 3 Royal Plates	.....	untried.	.....	.....	Northampton	Mr. S. Dickens	.....	10 gs., h. b. 3 gs.
Knight of Avenel.....	chessut	6	by the Doctor, out of Blue Bonnet, by Touchstone	..... started 6, won 4	won the Port	.....	untried.	.....	.....	S. Park, Theobalds	Mr. A. Gray	.....	7 gs., h. b. 3 gs.
Knight of Gyrene.....	brown	6	by Gilbert Gurney, out of Seaweed, by Slane	..... started 17, won 5	won Newton St. Leger.	.....	untried.	.....	.....	Swalwell, Banbury	.....	.....	£3 5s., h. b. 3 gs.
Knight of the Whistle.....	chessut	15	by Velociped, dam by Whisker	..... started 27, won 12	won Royal Hunt Cup	.....	2	Butterfly	.....	Wilden Paddock,.....	J. Fielding	.....	5 gs., h. b. 3 gs.
Kremlin.....	brown	17	by Sultan, out of Francesca, by Partizan	..... started 18, won 6	won Clevedon Cup	.....	10	Rap	.....	Duddinghill, Wilden	Mr. Bullock	.....	5 gs.
Lamocost.....	brown	18	by Liverpool, out of Ouis, by Buzzard	..... started 40, won 20	won Scot Cup	.....	14	Truth	.....	Yadbury	Mr. Kitchin	.....	10 gs. (40 mares)
Label.....	brown	11	by Pantaloon, out of Pasquimide, by Canal	..... started 17, won 3	won C. C. Legger	.....	2	.....	.....	Duddinghill, Wilden	F. Bullock	.....	12 gs. (40 mares)
Ladstone.....	bay	13	by Touchstone, out of Landrade, by Langar	..... started 12, won 6	won Anglesas	.....	4	.....	.....	Danebury	.....	.....	£5 5s., h. b. £2 10s.
Ladstone.....	bay	13	by Giovanni, out of Magesy, by Sultan	..... started 22, won 6	won Liverpool Cup	.....	2	Fuze	.....	Duddinghill, Wilden	T. Bullock	.....	5 gs.
Loup-Garon.....	brown	7	by Laurecost, out of Moonbeam, by Tomboy	..... started 6, won 1	received £15 ft. untried.	.....	untried.	.....	.....	Redlands, Reading	W. Jennings	.....	10 gs., winners half price, &c.
Malcolu.....	chessut	10	by the Doctor, out of Myrrha, by Malek	..... started 8, won 2	won Prince of Wales's S	.....	4	Anteveria	.....	Cawston, Rugby	.....	.....	10 soys.
Midas.....	chessut	13	by Taurus, out of Lynessa, by the Flyer	..... started 10, won 3	ran second for St. Leger.	.....	untried.	.....	.....	Red Lion, Great Driffield	Mr. R. Stockdale	.....	7 gs., h. b. 2 gs.
Midnut.....	chessut	10	by Emilius, out of Miss Giles, by Lottery	..... started 10, won 5	won Ebor Handicap	.....	untried.	.....	.....	Lowfold, Wisbro, Sussex	Mr. S. Scott	.....	2 gs.
Nutwith.....	bay	15	by Taurus, out of Oak Apple, by Royal Oak	..... started 10, won 9	won the Palatine S.....	.....	37	Sir Tatton Sykes	.....	Turf Tavern, Doncaster	W. Scott	.....	18 gs.
Oakley.....	bay	12	by Touchstone, out of Vulture, by Langar	..... started 4, won 1	won the Derby	.....	3	Marla	.....	The Ham, Arundel	.....	.....	12 gs.
Orlando.....	bay	12	by Touchstone, out of Vulture, by Langar	..... started 4, won 1	won the Derby	.....	3	May Blossom	.....	Trekhill Castle, Rother-ham	.....	.....	8 gs.
Preppendo.....	bay	13	by Sycamore, out of Pantaloon, by Pantaloon	..... started 5, won 2	won Cleveland Cup	.....	1	.....	.....	Burgill, Stamford	Mr. H. Rose	.....	10 gs.
Preppendo.....	bay	13	by Sycamore, out of Pantaloon, by Pantaloon	..... started 5, won 2	won Cleveland Cup	.....	1	.....	.....	Fountain Inn, Bedford	Mr. Hard	.....	10 gs., h. b. £2 5s.
Preppendo.....	chessut	10	by Emilius, out of Harriet, by Pericles	..... started 6, won 2	won the Derby	.....	untried.	.....	.....	Bourghley	Mr. H. Rose	.....	10 gs.
Preppendo.....	chessut	22	by Emilius, out of Harriet, by Pericles	..... started 6, won 2	won the Derby	.....	untried.	.....	.....	Hampton Court	Mr. Chapman	.....	10 gs., h. b. 2 gs.
Preppendo.....	chessut	22	by Emilius, out of Harriet, by Pericles	..... started 6, won 2	won the Derby	.....	untried.	.....	.....	Hampton Court	Mr. Chapman	.....	10 gs., h. b. 2 gs.
Pontifex.....	brown	13	by Touchstone, out of Variation, by Bustard	..... started 8, won 7	won Gt. Duke's Michael S.....	.....	4	Leopold	.....	L. Stables, Worcester	Mr. Broxidge	.....	15 gs. (subhs. full)
Pontifex.....	bay	9	by Touchstone, out of Enterprise, by De-fence	..... never appeared	.....	.....	untried.	.....	.....	Horseleath, Linton	Mr. H. Rose	.....	10 soys.
Pontifex.....	bay	9	by Touchstone, out of Enterprise, by De-fence	..... never appeared	.....	.....	untried.	.....	.....	Burton Padesa, Hull	Mr. Baxter	.....	10 gs.
Poynter.....	bay	10	by Touchstone, out of Enterprise, by De-fence	..... never appeared	.....	.....	untried.	.....	.....	Great Driffield	Mr. T. Howden	.....	5 gs.
Pyrhus the First.....	chessut	10	by Epirus, out of Fortress, by Deface	..... started 22, won 5	won £50 at Newmarket.	.....	untried.	.....	.....	Wroughton, Swindon	Mr. H. Reeve	.....	5 gs., h. b. 2 gs.
Ramadan.....	bay	16	by Betram, dam by Reveiler	..... started 6, won 1	won Great Yorkshire S.....	.....	2	The Hatchet	.....	York	J. Fielding	.....	5 gs., h. b. 2 gs.
Ratan.....	chessut	12	by Buzard, dam by Picon	..... started 18, won 10	won the Derby	.....	untried.	.....	.....	Wilden Paddock,.....	.....	.....	12 gs.
Red Deer.....	bay	12	by Venison, out of Soldier's Daughter, by started 20, won 10	won Chester Cup	.....	.....	8	Timid Fawn	.....	Say Horse, Selby	Mr. Markham	.....	5 soys., h. b. 2 soys.
Red Hart.....	bay	8	by Venison, out of Soldier's Daughter, by started 16, won 8	won Grand D. Michael S.....	.....	.....	untried.	.....	.....	S. Farm, Theobalds	Mr. A. Gray	.....	10 gs., h. b. 3 gs.
			The Colonel							Holly Bank, Barton, Newstead	R. Ridsdale	.....	10 soys.
			The Colonel							Goodwood	Mr. Keut	.....	10 soys.

STALLIONS FOR THE SEASON 1853—(Continued).

Name.	Colour.	Age.	Pedigree.	Performances.	Principal Performance.	No. of winners out of.	Sire of	Standing at	Apply to	Price.
Benetton	bay	7	by Venison, out of Polly, by Bay Middleton	started 8, won 3	won Ascot Derby	untried.	Trind Fawn	Milton Abbott, Tavistock	Mr. Bickell	5 gs., h. b. 2 gs.
Robert	bay	7	by The Saddler, out of Fanny, by Liverpool	started 15, won 7	won Wolverhampton S. Cup	untried.	Hesse Homberg	Thompson, Knaresbro'	Mr. T. Groves	5 gs., h. b. 2 gs.
Robert-Graham	brown	14	by Sir Hercules, out of Duncannon, by Emilius	started 40, won 7	won Sussex St. the Derby	untried.	Hesse Homberg	Newmarket	Messrs. Barrow	20 gs. (15 mares)
Bunyan	bay	19	by Faugh-a-Ballagh, dam by Bran	started 1, won 1	won Northampton P. (2)	5	St. Oswald	Derlington, Knaresbro'	H. S. Waring	7 gs., h. b. 2 gs.
St. Herbert	brown	19	by Carton, out of Darlington, by Amadis	started 38, won 11	won Northampton P. (2)	18	St. Rosalia	Newmarket	Mr. R. S. Pettit	10 gs.
St. Francis	bay	18	by St. Patrick, out of Surprise, by Soud	started 49, won 28	won the Ascot Cup	untried.	—	Lowford, Wisbro', Sussex	—	5 gs.
St. Lawrence	brown	16	by Sky-lark or Lapwing, out of Helen, by Black lock	started 58, won 28	won the Chester Cup	untried.	—	—	—	—
St. Leon	brown	9	by D'Egville, dam by Humphrey Clinker	started 18, won 8	won £205 at Newmarket	untried.	—	Ashton Wiltons, Newton	Mr. W. Roberts	5 gs., h. b. 2 gs.
St. Martha	brown	18	by Acton, out of Galan, by Walton	started 18, won 9	won Dunmurry Cup	21	Eryx	Bone-Paddock, Sheffield	F. Croft	5 gs., h. b. 3 gs.
Sea, The	bay	23	by Whalobone, dam by Orville	started 5, won 2	ran well in Steeplechases	1	Mermald	Bonschild-farm, Tamworth	—	6 sovs., h. b. 2 gs.
Sir Henry	brown	13	by Sheet Anchor, out of Nanette, by Partisan	started 5, never appeared	—	untried.	Tobolski	Clay Hill, Epson	H. Wychell	7 gs., h. b. 3 gs.
Sir Henry Martin	brown	4	by Lamercost, out of Miss Martin, by Voltaire	never appeared	—	untried.	—	Clay Hill	Mr. Abbott	5 sovs., h. b. 2 gs.
Sir Hercules	black	27	by Whalobone, out of Miss Martin, by Voltaire	started 1, won 7	won the Claret	38	Faugh-a-Ballagh	Bushbury, Wolverhampton	J. Daley	10 gs.
Sir Richard	bay	8	by Touchstone, out of Falcemia, by Chateau d'Argaux	started 1, never appeared	—	untried.	—	3, Park Terrace, Brixton	J. Ramsay	6 gs., h. b. 3 gs.
Sir Tatton	Spikes	10	by Melbourn, dam by Margrave	started 12, won 4	won St. Leger	2	Mr. Sykes	S. Farm, Theobalds'	Mr. A. Gray	10 gs., h. b. 5 gs.
Slane	bay	20	by Royal Oak, dam by Orville	started 12, won 6	won Waterloo Shield	81	The Princess	N. Park, Enfield	Messrs. Barrow	90 sovs. (35 mares)
Scatterley	bay	8	by Penitentiary, out of Liberia, by Liverpool	started 24, won 14	won Newmarket St. Leger	untried.	—	Newmarket	Messrs. Barrow	7 gs.
Spanish Jack	brown	10	by Don John, out of Miss Lydia, by Walton	started 3, won 1	won £70 at Newton	untried.	—	Clay Hill, Bockenhain	—	10 gs.
Spanish Jack	bay	8	by Hetman Planch, out of Oblivion, by Jerry	started 3, won 3	won £20 at the Derby	untried.	—	Eaton, Chester	—	—
Stair, The	grey	15	by The Saddler, dam by Mimos	started 17, won 9	won Newcastle St. Leger	3	Equiria	The Lodge, Malton	T. Bateson	5 gs., h. b. £2 12s. 6d.
Storn	bay	11	by Touchstone, out of Ghuznee, by Pantaloon	started 2, won 1	won £460 at Doncaster	untried.	—	Doncaster	J. Cookson, Esq.	30 gs. (30 mares)
Surprise	brown	11	by Touchstone, out of Cracifix, by Priam	started 16, won 9	won the Derby	untried.	—	Neasham, Darlington	W. Jennings	10 sovs. (30 mares)
Sweeten-st.	brown	6	by Gladstator, out of Lollypop, by Starch	started 24, won 22	won Queen's Vase	6	Guava	Redlands, Reading	T. Honess	2 gs.
Sweeten-st.	bay	6	by Wintonian, out of Lollypop, by Starch	started 24, won 22	won Queen's Vase	6	—	Wentworth, Swinton	—	5 sovs., h. b. 2 sovs.
Swindon	bay	16	by Malatto, out of Venilia, by Whispede	started 2, never appeared	—	untried.	—	Mentmore, Leighton Buzzard	Mr. Fountain	10 gs., h. b. 5 gs.
Swindon	brown	16	by Emilius, out of Maria, by Whisker	started 6, won 3	won Doncaster 2 yrs. S.	14	Alcoran	—	—	5 gs.
Thistle-whipper	bay	15	by Beagle, out of Miss Muley, by Filio-da-Puta	started 11, won 8	won £925 at Newmarket	11	Rushanger	Longstock, Stockbridge	—	5 gs.
Tory Boy	brown	15	by Tomboy, out of Bessy Bellam, by Filio-da-Puta	started 2, won 2	won Chester 2 yrs. S.	4	The Iron Duke	Adlington, Clieshire	—	—
Trap	brown	22	by Galad, out of Bantor, by Master Henry	started 21, won 16	won St. Leger	105	Surplice	Eaton, Chester	Mr. S. Beazley	30 gs., h. b. 9 gs.
Trap	brown	9	by Ratcheter, out of Sovereign, by Orville	started 24, won 10	won Audley End S.	untried.	—	Sumner Park, St. Neots	Mr. Brayley	6 gs., h. b. 2 gs.
Tuffinham	brown	7	by Taurus, out of Clarissa, by Defence	started 5, won 3	won Chesterfield Cup	untried.	—	Knoockhill, Evesham	R. Menzies	7 gs., h. b. 2 gs.
Turnis	bay	7	by Touchstone, out of Verbeua, by Velociped	started 27, won 14	won £300 at Liverpool	untried.	—	Dalkeith, N. B.	—	7 sovs., h. £3 10s.
Urel	bay	9	by Mus, out of Firefly, by Lamplighter	started 17, won 11	won Ascot S. (2)	untried.	—	Aldeburgh, Banbury	Mr. G. Savage	5 gs., h. b. 2 gs.
Namoyre	bay	20	by Venison, out of Val, by Langer	started 27, won 11	won Newmarket S.	untried.	—	Harewood, Leeds	Mr. Downes	5 gs., h. b. 2 gs.
Verdian	bay	6	by Voltaire, out of Wiry, by Waxy	started 11, won 5	won the Derby	14	The Baroness	Lane Paddock, Sheffield	F. Croft	10 gs., h. b. 5 gs.
Vortex	brown	4	by Voltaire, out of Martha Lynn, by Malatto	started 3, won 2	won 4-year-old S.	untried.	—	Asks, Richmond, York	Mr. S. Boone	10 gs. (30 mares)
Wendover	brown	11	by Sheet Anchor, out of Miss Letty, by Priam	started 6, won 1	won £74 at Reading	4	—	Turf Tavern, Doncaster	Mr. W. Daykins	16 sovs.
Wendover	brown	6	by Pantaloon, out of Phryne, by Touchstone	started 6, won 1	won Ascot Stakes	untried.	—	Newmarket	—	10 sovs.
Wendover	bay	31	by Sandbeck, out of Johanna, by Sultan	started 17, won 7	won Ascot Stakes	3	Weatherage	Cawston, Rugby	Mr. H. Rose	5 gs., h. b. 2 gs.
Yashar	bay	16	by Sandbeck, out of Johanna, by Sultan	started 1, never appeared	—	untried.	—	Burleigh, Stamford	—	—
Young Physician	bay	16	by Physician, out of Spacwile, by Soothsayer	never appeared	—	untried.	—	Bay Horse Selby	Mr. Markham	5 sovs., h. b. 2 sovs.

The Groom's Fee, if not included, varies from half-a-crown to a sovereign, in proportion to the charge of covering. The following horses will stand this season in Ireland.—At the Curragh: Dough, Harkaway, Horn of Chase, Maggie, Star of Erin, and Tearaway. At Caledon, near Dublin: Crescent, Simoon, and The Ugly Buck. In Dublin: Frederick and The Railway King. At Ardee, County Louth: Crosier and The Day of Algers. At Rathbridge: Bryan O'Lynn. At Hillsborough: Elvas. At Sharvogue: Freney. At Bellewstown: King Dan. At Carrickmacross: Polish. And at New Hall, Ennis: Saucy Dick. We find it impossible to perfect the particulars relating to many of these.

## ON THE ARTIFICIAL PRODUCTION OF FISH IN OUR RIVERS.

Not unconnected with the agriculture of the country, and certainly not uninteresting to the rural improver, are the wonderful discoveries just brought to bear on the artificial production of fish in our rivers. The whole subject seems to open out a new source of profit to the speculator, of interest to the naturalist, and of the increase of the nation's food. The capture of salmon—brought now to perfection so great, that our rivers are about denuded of that prince of fishes—ceases to be either skilful or surprising before the schemes in operation for breeding that fish. Not only has it been tested by the stocking of the French rivers and streams of the Vosges, the Moselle, the Upper and Lower Rhine, but the spawn has been successfully transported to New Zealand.

A recent number of the *Journal of the Highland and Agricultural Society of Scotland* attributes the discovery of the plan to Mr. John Shaw, of Drumlanrig, so far back as 1833, and further proved by the Rev. D. S. Williamson, ten years afterwards. But the scientific world seems to have been still earlier at work; for, in 1764, Professor Jacobi, of Berlin, discovered that the roe of fish was fecundated after ejection by the female; and more, that the roe and milt extracted even from dead fishes possessed the vital power, and even when dead two or three days that this power is not lost. The Professor also mentions how fish may be thus introduced into new districts, and even carried to other countries.

During the course of last summer, a small pamphlet, on the artificial production of fish was published by Reeve and Co., which called particular attention to the French adoption of the joint discoveries of the German professor and the Scottish gardener, in filling the French streams and rivers with millions of fish of the most valuable kind.

Mr. Boccicus last year undertook the arduous task of transporting fecundated trout spawn to New Zealand. Gravel was placed in large iron boxes, with a supply of river water, in order to effect the necessary change; for in water totally stagnant the fish will not be produced. Owing to the warmth of the tropical atmosphere, in the journey the young were produced before the ordinary time. The usual period varies from 70 to 100 days, according to temperature; but in this case, we believe Mr. Boccicus found them produced in about 42 days. The effect of a stream was obtained by constant dropping from a tank above the iron box; the water, in which was, we believe, purified by the valisneria.

The originators of the French practice were two fishermen of the names of Gehin and Remy, of La Bresse, who, finding the fish fail in their streams, began to collect the spawn and apply the milt themselves, which they deposited in boxes or baskets full of holes, and placed them in situations of safety in running streams. A French paper says, "Applying this operation, the year afterwards, to a great number of fish, they obtained several thousand trout; and, in a year or two more, the numbers had literally increased to millions."

The French government considered the matter of sufficient importance to take it up, and these two fishermen were taken into its pay, and made to apply the principle to the streams of the districts we have mentioned. The same paper goes on to say: "They have done so with the most singular success; rivers and lakes, in which there were no fish, now literally teem with them."

The plan is to be further encouraged. A commission of *savans* is appointed to superintend the process. Salmon, perch, tench, and even lobsters are to be *domesticated*—so far at least as being bred and reared, out of the reach of their numerous enemies.

Perhaps no animal will multiply so fast as the fish. The tench produces 38,000 eggs, the mackerel 546,000, the cod fish 1,357,000. The herring produces also vast numbers, and, if only 2,000 of any one of these came to perfection, there would be, in the second year, 12,000,000, in the third 2,000,000,000. To protect only, therefore, is to ensure the production of millions of fishes; but how any fish now happens to escape their enemies, natural and artificial, seems positively more wonderful than their powers of production.

The breeders of fish artificially in this country are, Mr. Boccicus, Mr. Gurney of Carshalton, and Mr. Young, of Loehshin. What should hinder the plan being tried by the landed proprietors near the sides of all the rivers in this and the sister kingdom? and especially why not try to introduce the salmon into rivers where it has not yet been found? Mr. Shaw appears certainly to have been the first to show the parr and the smolt to be only stages of the salmon; and to prove that by the construction of side ponds, with a small stream running over them, with sufficient water to keep them covered, but not to be too deep, so as to favour the development of the spawn with as much rapidity as possible, the work will be done. The small fish will thus be preserved from their larger enemies until they have an opportunity of shifting better

for themselves, and vast supplies will be afforded to the sea, to return again, either to the same spot, or most certainly to the same river, in another year. The grise, or young salmon of from 2 $\frac{1}{2}$  to 3 lbs. weight, has been sent to market, the spawn from which they have come having only been deposited in the preceding October or November, three months of this to be allowed for hatching—and often a longer period. A grise, weighing 6lbs. in the month of February after spawning, has, in its return from the sea in September, weighed 13lbs.; and, according to Jessie, a salmon fry of April will in June weigh 4 lbs., and in August 6 lbs.

Taking the rapid growth, the immense powers of reproduction, and the command which the artificial production seems to have upon the fish, we hardly know a subject of greater national importance than the encouragement of these invaluable experiments—if so they can now be called, after success so abundant.

We would strongly urge the thorough investigation of the subject, and the construction of breeding-ponds near the heads of our principal rivers, properly secured. The experiment has interest in itself enough to repay the trouble—for expense there seems to be but little—and, if Jacobi be right, almost every purchaser of a male and female salmon has the power of putting the process into operation. Might not the Royal Agricultural Society of England investigate this subject with profit and advantage both to landlord and tenant?

#### ON THE VALUE OF SWEDE TURNIP TOPS AS PROVED IN LINCOLNSHIRE NEARLY A HALF CENTURY BACK.

TO THE EDITOR OF THE MARK-LANE EXPRESS.

SIR,—For the information of your readers, I will first show what weight of Swede tops *can* and *has* been produced per acre. I beg to inform you that I was at Mr. Bull's, at Castlethorpe, Bucks, on the 23rd of August last, and I saw upon his highly managed farm the most fruitful piece of Swede turnips I had seen. The bottoms were large and fine, and the tops were remarkably strong; I never saw stronger—so much so, that Mr. Bull's youngest son and myself cut off several of the middle-sized tops, and the said tops weighed upon an average 1 $\frac{1}{2}$  lbs. each. The turnips being planted 24 inches from row to row, and set out 10 inches from turnip to turnip in the row, each turnip taking up 210 square inches, at which rate there would be 26,136 turnips upon an acre; and the tops weighing 1 $\frac{1}{2}$  lbs. each, there would be a trifle over 17 $\frac{1}{2}$  tons per acre of tops, which is the weight per acre of an average crop of rape or colza seed. Ought such a weight of fine tops to rot on the ground? In North Lincolnshire, for upwards of 50 years, I have known large farmers, just after Michaelmas, break off the front teeth of their old ewes, just above the gum, with large pinners. By

pressing the pinners hard, the teeth will break off like glass, without any pain to the sheep. The ewes are then put on the Swede turnips to eat off the tops before other sheep which have their turnips cut for them. The said ewes, with broken teeth, cannot eat the bottoms, and they very soon get fat enough, upon tops only, for Smithfield market. Mr. Dawson, of Albury Hall, near Ware, Herts, had a lot of long woolled ewes, Lincoln, in Smithfield, 21st March last, sold by Messrs. Eland and Son out of their wool, or shorn, at 53s. each, fed upon Swede tops only. When Mr. Dawson lived at Witcail, near Leath, Lincolnshire, he occupied about 3,000 acres of land, and boarded and lodged 34 ploughmen in his house, and grew from 500 to 600 acres of turnips yearly, and put 1,500 ewes, yearly to the ram. Not only Mr. Dawson, but his father, who occupied the land before him, broke off the front teeth of his old ewes, and fed them upon turnip tops, which produced a great weight of mutton upon tops only, which tops, in many counties, would have rotted upon the land before the young tops or sprouts appeared. And Mr. Dawson follows the same system of feeding ewes upon Swede tops only upon the Albury Hall estate, which he purchased in Hertfordshire.

Yours obediently,

Vinciball, Surrey, April 15.

S. A.

#### SWEDE TURNIPS.

SIR,—In your agricultural journal of last Monday, in which there is always so much useful and profitable information to the cultivators of the soil, to keep pace with the times, your correspondent, signed "A Yorkshireman," wishes to be informed "the greatest weight of Swede turnips known to be grown in England per acre, when topped, tailed, and well cleaned; also stating the distance drilled from row to row, and when thinned out from turnip to turnip in the row, to produce the greatest quantity per acre." I beg to inform the Yorkshire gentleman that I have known a little over 40 tons per acre grown when topped, tailed, and well cleaned. But a great deal depends upon the season as well as high farming. I consider it an even bet that, with high farming, a farmer may grow 40 tons per acre once in seven years, but 30 tons per acre are nearer the mark than 40 upon an average of seven years. It is known to many farmers in Warwickshire, as well as many others, that the Earl of Aylesford, within this last seven years, upon Merridon Heath, near Coventry, grew 40 tons of Swede turnips per acre upon 7 acres, and 36 tons per acre upon 11 acres, planted 28 inches from row to row, and 10 inches from turnip to turnip in the row. Each turnip taking up 280 square inches if planted regularly, there would be 22,102 turnips, which at 3lbs. each only is 50 tons 6lbs. per acre, at 4lbs. each turnip upon an average is 40 tons 8lbs. per acre. This was upon land let by the noble earl a few years back at under 5s. per acre. Mr. Walker Hardwicke, of Dyke, near Bourne, Lincolnshire, has grown upon his own estate 38 tons per acre; and 40 tons per acre have been grown at Bourne; and 40 tons per acre upon a single acre in Stamford Field, Lincolnshire, by Mr. Woolstan, and the said 40 tons were sold by weight, to go off the land when topped, tailed, and well cleaned. Mr. Bull, of Castlethorpe, Bucks, grew, last year, 38 tons of Swedes per acre, after being a little blighted. Mr. Bull's turnips were planted 24 inches from row to row, and set out 10 inches from turnip to turnip in the row. At that rate, each turnip taking up 240 square inches, there would be, if planted regularly, 26,136 turnips, and 38 tons per acre, and divided by the number of turnips, 26,136, is only 3 $\frac{1}{2}$  lbs. each



turnip to make up 33 tons per acre. The heaviest crop of Swede turnips I saw last year was upon a farm near Woburn, Bedfordshire, occupied by Mr. Redman, and rented of the Duke of Bedford, in a close of Swedes of about 10 or 12 acres, planted about 27 inches from row to row, and about 12 inches from turnip to turnip in the row, each turnip taking up 324 inches. At that rate, an acre, if planted regularly, would be 19,360 turnips. This fine crop was not weighed, but estimated by first-rate judges at a little over 40 tons per acre. Many of the said turnips weighed 9lbs., 10lbs., 11lbs., 12lbs., and some as much as 13lbs. each, when topped, tailed, and well cleaned; and Mr. Redman's 40 tons per acre, divided by 19,360 turnips, averages 4lbs. 10oz. each turnip. These turnips were grown upon some poor sandy land, but highly farmed, and the turnips exceedingly well managed, upon the London market garden system—people continually employed to keep them free from weeds, &c. Of course a great expense upon them in labour. They were planted in the beginning of May, about three weeks before Mr. Bull planted his. It is plain to grow Swedes to a very large size you require the whole summer for them to come to their full growth, and a gardener and a boy in the month of May, occupied putting in seed or plants where required to make up a full crop, as a small average for turnip, if planted regularly, will produce 40 tons per acre. Swedes, to be transplanted in May, the seed should be sown in the beginning of April, in a warm, well sheltered garden. I have known swede seed sown the 1st of April, and transplanted in May, that has produced turnips to weigh 8, 9, and 10lbs. each.

S. A.

Vauxhall, Surrey, April 19.

### SALE OF SHORTHORNED CATTLE, &c.

On Wednesday last, the 20th April, the sale of the entire herd of shorthorns, consisting of 42 head of bulls, cows, and heifers, the property of Barrall Fuller, Esq., of Holcomb, near Dorking, were submitted to public competition under the able superintendence of Mr. Stratford, of London. The sale was attended by several distinguished breeders from various parts of the kingdom, as well as by some gentlemen from the United States, and a goodly number of gentlemen and farmers of the district. The prices realized fully prove the estimation in which the stock were held: the highest price was 115 guineas for a two-years-old heifer, "Buttercup," bred by Harvey Combe, Esq., Cobham Park, Surrey, and bought by Mr. Fuller, when a calf, at his last sale; she was now purchased by Mr. Alexander, from Kentucky, United States. This gentleman was also the buyer of a fine bull, "Lord John," at 70 guineas, and several other animals; and we heard it remarked that he has visited most of the celebrated herds in the kingdom, from several of which he has purchased the best specimens he could secure, and will probably export the finest lot of cattle ever sent out at one time by any single individual, and we wish him all the success his spirited and patriotic conduct deserves. Several other bulls, cows, and heifers realized good prices—as "Victoria" 65 guineas; her calf, "Alberta," only a few weeks old, sold for 28 guineas; "Mab" 54 guineas; "Molly Bawn," 3 years old, 48 guineas; her calf, "Kathleen Bawn," 6 months old, sold for 46 guineas; "The Cardinal," 42 guineas; "Koh-i-noor," 1 year old, for 35 guineas; "Betsey Pig," 25 guineas; "Songstress," 35 guineas; "Sarah Gamp," 32 guineas; "Maid Marion," 31 guineas; "Nightingale," 34 guineas; "Nana," 30 guineas; "Holcomb," 30 guineas; the others also brought good prices. Total amount of the sale, including a few Southdown tegs and

two young colts, was upwards of £1,550. Mr. Fuller seemed highly gratified with the result of the sale, and although we believe the county of Surrey cannot boast of either cattle or sheep as native animals, and by many only considered fit to cury the latter description of stock, yet here we see a heifer bred and reared in the county that would do credit to any part of the country; and the same remark may be applied to the general stock, which were produced in a fine healthy condition, alike creditable both to Mr Fuller and his bailiff, Mr. Lucas, and we hope the success which has attended the introduction of this valuable description of cattle into this part of Surrey, may induce other gentlemen to follow so good an example. In conclusion we may add, that the general arrangements of the sale were good, and that the company were entertained by Mr. Fuller with his usual hospitality.—(From a Correspondent.)

### ANSWERS TO AGRICULTURAL QUERIES. OLD GRASS LAND.

TO THE EDITOR OF THE MARK LANE EXPRESS.

STR,—We have broken up old grass lands of various kinds, in various provinces of the kingdom, and would not recommend paring and burning a thin alluvial soil only five inches in depth, incumbent on boggy peat or any other subsoil; and we fear it is too late in the season for any other practice by "Quæstor." Had the seventy acres been ploughed up early in winter, so as to have got the pulverizing and consolidating influence of the weather, and then oats sown along with a small dose of guano-mixture or other artificial manure, for the two-fold purpose of supplying food for the young plants, and promoting the decomposition of the effete vegetable matter peculiar in all lands of this kind, comparative success might have attended the practice; but we fear that so late as this it would be impossible to get the fallows into a consolidated form to undergo decomposition, or a mould sufficient to cover seed and guano, however actively the harrows and roller might be kept going. Much, however, depends upon the soil. We have ploughed as late as this, and succeeded; but we have oftener seen failures—almost no crop at all.

Paring and burning old grass lands is a very exhausting system, involving the theory of burning the stack-yard for the sake of the ashes. We were very forcibly struck with this idea in 1846, in Huntingdonshire, where we pared and burned to a large extent, and where the incendiary burning of stack-yards was severely experienced at that period. In order to test the amount of vegetable matter burnt, we ascertained how much one square yard contained, and found it amounted to several times our employer's stack-yard—a large one. We shall return to the subject in a different column of the paper soon.

A CORRESPONDENT.

STR,—In answer to "Quæstor" respecting ploughing up his old grass land, I should say, by all means pare and burn it, sow it with colesed, and then take a crop of oats; the ashes acting as a stimulant to the colesed, an abundant crop of this will at once ease the land of much of that superabundant rankness and tendency to mildew which all new land is subject to.

Yours, &amp;c.,

ONE WHO HAS TRIED IT.

STR,—In reply to your correspondent, "Quæstor," on the breaking up of grass land, I would suggest to him the propriety of paring and burning the surface, then sowing a green crop, and afterwards sowing oats. From "Quæstor's" description of the soil, I should consider that he would be liable to

injury from wireworms, grubs, &c., if he was only to plough and sow oats on the land this spring; and I have no doubt the increased produce of the succeeding white crops, after the paring and burning, would more than repay the extra expense attendant upon the burning and breast-ploughing. It is only on thin dry soils, that grow a fine description of grass, that it is safe to dispense with burning the surface; but in all cases where the surface grows a rough coarse herbage, and the sub-soil moist and peaty, paring and burning should always be adopted. Would suggest to "Quæstor" that when he has got his grass land into tillage, not to work the willing horse too hard by a repetition of succeeding white straw crops.

I remain, your obedient servant,

WM. BEARN.

Handley Farm, Towcester, March 24.

STR.—Last year I ploughed up a very old meadow of four acres, producing little or nothing in the shape of grass, the soil being gravelly and hot, burnt up in the summer, and wet and

swampy in winter. It was broken up in February, and planted with potatoes; the crop was taken up in July, the field was then harrowed down, and the ground levelled. I sowed it with hay and cloverseed, and inoculated it with turf, which was taken up from a common, and pulverized in one of Mary Wedlake's grass-tearing machines; the turf was planted in rows six inches apart, and last October, notwithstanding the dry weather of the two preceding months, I fed it off, having a considerable quantity of feed on it, sufficient for my three horses until the end of January. I have now shut it up, for the purpose of making hay of it in June, proving, without the shadow of a doubt, the possibility of making a new meadow within twelve months.

I remain, sir, respectfully,

Yours very obediently,

FENWICK DE PORQUET.

Fairkyles, Hornchurch.

P.S.—Any of your readers who may be sceptical may see the meadow in this parish, at Little Longstons, near my residence.

## CALENDAR OF AGRICULTURE.

The planting of beet and potatoes must now be quickly finished, if any remain to be done from last month. Horse and hand-hoe all drilled crops; allow not a single weed to be seen.

Turn over the heaps of winter-prepared dung, and the fermentation will readily commence; and during its progress lay it in the drills of the land; reverse the drills, and sow the seeds of Swedish turnips immediately. Much benefit is derived by bringing the seed into near and immediate contact with the fermenting dung. In the first place, sow ruta бага, then Laing's and Matson's hybrids, and follow with Aberdeen yellows. In dry weather, roll the drills immediately; in moist, showery weather, it may not be required.

Plant cabbages, kohl rabi, savoys, and winter brocolies from the seedbeds, on drills 2½ feet apart, and the plants two feet distant along the drills. Apply wet, half-rotten dung in abundance, on strong lands that are too stiff for turnips, and dibble the plants in the wettest weather in which work can be performed, as they require much moisture. Fill up all blanks with fresh plants, in order to produce an even crop. Sow early turnips for an early crop, as tankards and whites; and sow rape, to be eaten on the ground, as preparatory for wheat.

Pare and burn rough lands in the surface, and spread the ashes, to be cooled. Prepare, without one moment's intermission, the fallows for green crops, and also clay land fallows for wheat.

Stall-fed cattle will now be disposed of—the fat ones to the butcher; and the leaner will go to the pasture fields, to be fattened on grass. Put the milch cows to grass in a home field of permanent pasture, adjacent and convenient, provided with water and shelter, and improved by frequent top-dressing, and the sowing of clovers and strong

perennial grasses. The oldest calves may go to the grass paddock; and if the herbage be scanty, they must have a help in clovers and vetches given them in racks. A shelter shed and a supply of fresh water are indispensable.

The latest lambs will now require much attention. Give them the best grass on the farm, in order to raise them to an equality with the fore-most. Nothing more clearly shows the good management of animals than an equality both in the breeding and condition.

The ewes and lambs that are eating the early vetches and rye must have fresh food every two days. Begin the soiling of horses and cattle in the yards; mind the milch cows also, if the pasture be not abundant. Feed the store pigs with clovers and vetches, and give ample littering to all animals.

As the early soiling green crops are consumed, plough the land for turnips.

Put mares to the stallion, and geld colts, though this operation may be more safely performed the previous autumn.

Finish the sowing of grass seeds on barley tilths. Sow by machine, and cover by light harrowing and heavy rolling.

Dig hop plantations, and tie the bine to the poles. Shut up watered meadows for hay.

Wash sheep by hand, in a clear running stream; and, for preventing the maggot fly, sprinkle the animal from head to tail, from a dredging box, with a mixture of hellebore root-powder and of black brimstone, ½ lb. to 1½ lb.

Weed young quicksets, but do not expose the roots too much to the sun's rays in dry situations. Rather leave the weeds to moisten the roots, provided the upward growth be not stopped.

## CALENDAR OF HORTICULTURE.

## GENERAL REMARKS.

If we except the late period at which most of our tender fruits expanded their blossoms, and the injury done to sundry plants which had stood the last three or four winters, as well as the deficiency of Broccoli and some other things, there does not seem to be any very marked difference between the state of things in general at the present period and that which we usually meet with at the same time of the year. Nature is so accommodating in all her movements, that whatever severities we are now and then made to feel are usually compensated in another way; and though we have the usual long list of complaints of injury done to plants, the unkind working of the soil, and other misfortunes—and in our own department we could make out a goodly list of such grievances—yet we are inclined to believe that the present season holds out a full share of promise as regards the future. Yet our gardening friends will have all felt the effects of the long delay of ordinary out-door work, so as to have had their “hands full” lately. However, the busy time will be got over, and the work which the winter’s rain retarded will be more rapidly done, when long, fine days present themselves to do it in.

## CONSERVATORY.

Nothing must be allowed to mar the gaiety prevailing here. The choice of plants capable of ornamenting this house is so large, that a fastidious public is apt to reject all but the most gay and fine. It is therefore important not to introduce any plant likely to injure the appearance of the whole, but to select only the best of each section. More air will now be required, and if the weather become warm and sunny, shading will have to be resorted to, provided that a more natural shade does not exist in the shape of creepers; the latter, however, will occasionally require trimming and tying in, and where that is the case it is better to do it pretty close, as the rapid growth which takes place now will speedily enable them to recover their appearance; but some creepers showing blossom at their terminal points ought not to be too much cut away. Of this class is the beautiful *Tecoma jasminoides*; while with *Passiflora edulis*, and similar plants, the knife may be used with more freedom. This plant is excellently adapted for covering an unsightly wall or other offensive object; for it grows so quickly, is easily trained, and its fine shining foliage so fully compensates for the paucity of its flowers, that we are always ready to forgive its faults in this particular, and place it in the first rank as a conservatory creeper. Many plants will now be in full bloom which require a peculiar treatment afterwards; for instance, Herbaceous *Calceolarias*, of good promising varieties, must either be cut down while in their prime, or but little after it, otherwise the chances are that the plants will die after ripening seed, for it rarely happens that a plant will

ripen seed and live. *Cinerarias* are much the same, and however erect it may appear to ent a beautiful plant down at a time when it is most wanted, yet it is important to do so, if the perpetuation of the kind be desired. Seed should be saved of both these plants, only from the very best sorts; and to prevent the contamination of these, let every inferior flower be at once expelled from the house where seed is intended to be saved.

## OTHER PLANT HOUSES

will require air in greater abundance, with a proportionate supply of water. Although the latter is more likely to do harm by being overdone than the former, yet it must be administered rather liberally when the weather sets in dry and sunny. Hard-wooded plants will in many instances want potting during the progress of their growth, and propagation of the various kinds must also be attended to when additional plants are wanted; in fact, it is advisable to propagate a few of each kind every year, in order that you may be able to throw away any overgrown or unsightly ones. Keep all insects away, and plants going out of flower will require pruning back in many instances, in order to be more compact specimens. Heaths and *Epacris* will now require air both day and night; and everything calculated to encourage mildew must be removed from the house where they are placed. Shrubby plants—as *Veronicas*, *Fuchsias*, &c., will require plenty of room; and the soft wooded ones—as *Geraniums* and *Calceolarias*, if intended for exhibition, also. The latter will want additional pot-room as the season advances, and occasionally liquid-manure will be beneficial.

## FORCING DEPARTMENT.

*Vinery*.—Admit more air, and keep the house drier as the fruit ripens; and such moisture as it may be necessary to give for the welfare of the plants had better be applied early in the morning. As the fruit ripens, less fire heat will be required—in fact, it may be entirely dispensed with when the fruit is ripe; but usually the anxiety to have ripe fruit overcomes all other considerations, and fires are continued long after the welfare of the plants forbids their use. Thin the berries, and tie up the shoots of the later houses; and to the latest, just breaking, pay some attention, otherwise the shoot is apt to get too far advanced, and in a wrong place, ere the error be detected.

*Pinery*.—See to the advancing stems of fruit, that they do not bend to one side; if they should, stakes and tying up must be resorted to. Put in all suckers of Pines that may be at hand, and give the whole frequent syringing, excepting such as may be in flower; but even these will take no harm by a gentle damping now and then, provided it be done carefully and without violence: and this occasional syringing may continue after watering at the root has ceased, which

must be prior to the fruit changing colour. Give occasional watering with liquid-manure to such plants as would seem to have fully occupied the pots or spaces allotted them, and give air more abundantly than heretofore.

*Peach house.*—Let the directions given in the last few weeks be carried out; admitting, of course, more air as the season advances. The stoning period is always a critical one with the Peach; after that is perfected, give the fruit a final thinning; and, after tying up all shoots requiring it, let the whole have a good syringing, and let this be repeated every night, to keep away the red spider and other enemies.

*Cucumbers and Melons.*—The long season of dull weather in the early part of the month has been sadly against the latter of these setting their fruit well, so that we hear of many complaints; but where hot-water, or some other mode of heating than hot-dung has been adopted, the difficulty of getting the fruit to set is much lessened. Thinning the shoots and stopping them is about all that can be done to induce them to set well, and being particular as to the due proportion of air and water they receive.

#### FLOWER GARDEN.

The near approach of the bedding-out season increases the amount of care necessary here, as it often happens that every inch of spare glass and every snug corner gets filled with plants all ready and waiting for the fine weather allowing them to be planted outside. If there be many plants in small pots, and completely bound, much good will be done by turning them out upon a nice south border under a wall, mixing some leafy mould with the earth they are planted in; this, however will only do with such plants as are completely pot-bound. Dig over and prepare the beds for final planting, and get everything in readiness, so that when the proper time does arrive there may be no delay in getting them put in. It will also be advisable to consider which plants are to occupy the respective beds; and ascertain if there

be the requisite number of each, allowing in all cases a few to meet contingencies. The common borders may now be raked over, if not done before, and some of the common annuals may be sown in patches where wanted to flower. If the weather should keep dry, late-planted shrubs or late put-down turf will want watering, and any hardy herbaceous plants not yet planted may now be done, though certainly at a disadvantage; while cuttings of many things may be put in, as Double Wallflowers, Chrysanthemums, Sweet Williams, &c. And as soon as the Heartsease makes sufficient firm growth to admit of slips being taken off, these may be put in likewise.

#### KITCHEN AND HARDY FRUIT GARDEN.

Successional crops of Peas, Beans, Cauliflowers, Lettuces, and many other things, may be put in, and the earlier ones attended to according to their different wants. Weeds will now be making their appearance, and must be destroyed at once. Vacant ground, from which Broccoli, &c., has been cut away, must now be dug, and well manured at the same time; it will come in for Peas and other crops, or a part of it may be planted with Potatoes. Remove the covering from Sea-kail, and dig the ground, except such parts as have recently been covered up with sand, ashes, or other material, to blanch the stems without forcing. Let all advancing crops have every encouragement in the shape of stirring the ground, &c., and weed and thin such seedlings as require it, always bearing in mind the trite saying a northern nurseryman used to impress on his pupils as he sent them forth to office of trust—that to sow thick, thin in time, and keep on good terms with the cook, was the best of all methods to make things go on comfortably. Without venturing any remark on the latter charge, we certainly advise the two first being regarded as permanent laws; and when the devastation of insects or other marauders leave little to thin, a proper distribution of those remaining is often sufficient to meet the wants of the case. D.

## AGRICULTURAL REPORTS.

### GENERAL AGRICULTURAL REPORT FOR APRIL.

For the time of year, the weather during nearly the whole of this month has been extremely cold and ungenial, consequently by no means favourable to agriculture in general. As might therefore be expected, the crops have made very little progress in any part of the United Kingdom; nevertheless, our accounts having reference to the appearance of the young wheats are tolerably satisfactory. In most quarters they are described as looking strong and healthy, with very few losses of plant. When we consider that the breadth of land under wheat culture this season is nearly, or quite, one-fourth less than in the preceding year, the intelligence to which we have just referred must

be regarded with interest. Unfavourable periods for the sowing of grain are too frequently attended with heavy future losses; and even supposing that the acreable return should prove large, it is clear that the total growth will be under an average. Much of the land originally intended for heavy wheats has been turned to other purposes, and we need scarcely observe that, ever since the latter end of October, the farmer has had great difficulties to contend with. At one period, for several consecutive weeks, he was unable to get upon the land, such was its saturated condition; hence, out-door labours were wholly suspended, except indeed upon some light soils. We are now feeling the effects of the backwardness of several matters connected with farming; and many parties appear

to be of opinion that the value of most kinds of produce will, as a consequence, be enhanced. It is tolerably clear that we have seen the lowest point as regards the value of wheat; but we are by no means sanguine that any important rise will take place in it, as we must not lose sight of the fact that prices abroad, arising from the pressure of supply, are calculated to operate against all speculation. The stocks of wheat at this time on hand are tolerably extensive, and we have observed a decided improvement in the general condition of the samples lately disposed of in our leading markets. Those of barley are far from extensive, but certainly larger than at the same time in 1852. As regards beans and peas, very few stocks are to be met with in any quarter. To meet the necessary consumption between this and the close of harvest operations, large imports will be necessary.

Notwithstanding that the arrivals of stock from the continent have been on a liberal scale, our fat cattle markets have continued somewhat active, and prices have been on the advance. That we have been correct in our previous impressions with regard to the value of meat, is evident from the present state of the trade; and we may further observe that there is every probability of prices ruling above their present level, for the all-important reason that the supply of sheep in the United Kingdom is decidedly small, and that consumption is progressing at a rapid rate. The general health of the stock has continued good; but we perceive that in several quarters the winter supply of food is nearly exhausted. In the early part of the month, there was an active demand for linseed and rapeseeds at very full prices: but the supplies having since materially increased, the rise in the quotations has not been supported. The imports of linseed have not exceeded former seasons, arising from the high rates demanded by the growers in Egypt, and the extensive speculation carried on in that country by several of the leading English houses.

It is pretty generally understood that notwithstanding the numerous failures of last year, a large additional breadth of land has been planted with potatoes. The present high rates—say from 95s. to 165s. per ton—offer great inducements to the growers; but should the present crop prove a heavy one, it is most probable that the quotations will rule low. On the continent, the supplies are still large; and in some of the French ports fair average samples may be purchased at 70s. to 75s. per ton. The imports have, therefore, been somewhat extensive, they having amounted to upwards of 3,000 tons during the month; whilst from our own districts the arrivals have increased to some extent, although their quality has proved inferior.

The guano market has been on an excited state. The whole of the stock of Peruvian in first hands has been exhausted; hence small parcels have found buyers at from £11 to £12 per ton. These prices have induced shipments from Belgium; yet numerous orders have remained unfulfilled. The hay and straw markets have continued very firm, and prices have been fully supported. We understand that the supplies now on hand are comparatively small.

Owing to the proposed abolition of the Soap Duties, the tallow trade has ruled active, and prices have improved from 1s. 6d. to 2s. per cwt. The arrivals from the Colonies have fallen off, compared with some previous years.

As regards the article of wool, we may intimate that the trade for all descriptions has continued active. Prices of English have improved, and several large parcels have changed hands for shipment to Belgium. This year's clip is expected to be small.

In Ireland and Scotland the corn trade has been devoid of animation.

#### REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

The comparatively small supplies of sheep exhibited in most of our leading cattle markets, especially in Smithfield, added to the rapid increase in the consumption of all kinds of meat, have had their usual effect upon value. Since we last wrote, an extensive business has been transacted in each description of stock, and prices have had an upward tendency. It is just possible that present high rates may have the effect of checking the demand; but we must bear in mind that the working classes, almost generally, are fully employed, and in the receipt of higher wages than for a series of years past; hence, so far as our judgment carries us, there is a greater prospect of an advance than a decline in present rates. It may be safely presumed that Smithfield has considerable influence over the whole of the local markets, and that, during the summer months, Newgate and Leadenhall will be very scantily supplied from the provinces; consequently, the metropolis must derive its supply almost solely from the live markets. Taking it for granted that the available number of sheep in most districts is unusually small—and in this opinion we are borne out by most of our agricultural friends—it is highly probable that a large portion of the stock will be withheld during the period above referred to.

In the *Mark Lane Express* of the 4th ult. appears

an ably written letter on the subject of the shearing of fat sheep for Smithfield; and in which, for very obvious reasons, the impolicy of shearing sheep in cold weather is very properly urged. The writer justly observes that "mutton killed in the wool is worth more money than mutton killed out of it, because the value of the mutton is not only depreciated in quality, but also in quantity; for the daily waste upon a naked sheep in cold weather is much greater than that upon the sheep well clothed in its wool." These observations were never more exemplified than during the last two months; and we must say that if graziers in general did but consider the losses to which they have been subjected from premature shearing, they would speedily abandon the system altogether. Now it is a well-known fact that salesmen have much less difficulty in selling sheep in the wool than out of it, for the reasons stated above. It is true that, of late, butchers have derived considerable advantage from purchasing woolled sheep, as the market for skins has been on the advance, almost weekly; hence much competition has been observed for them. But, supposing that no shorn sheep had been brought forward up to this time, such is the extensive nature of the demand for English wool—a demand, by the way, that can scarcely be met—there is every reason to know that prices would have been from 1s. to 2s. per head higher than they are now, much labour would have been saved, and the price of the wool been returned with the value of the live carcass. The writer goes on to observe—"Butchers who buy in the wool say that the prices in the Smithfield reports are much under the truth—*i. e.*, that they are paying more money than is reported; while the quotations for sheep out of the wool are the reverse, the butchers' prices being considerably less than the reported prices." These remarks require close attention. In the first place it is evidently the duty of a reporter not to overstrain matters; in other words, it is essentially necessary that he should *know* something about fat stock, and have the best sources of information, to be enabled to do justice to all parties: and, in the second, to strike fair average prices, so as to show the actual state of the trade. Doubtless, salesmen and butchers frequently differ as respects the dead weights of stock, and it is possible that both parties may be sometimes mistaken on this important point; but the great difference between the value of sheep in the wool and those shorn—amounting to one shilling per lbs.—has solely arisen from causes to which we have already referred, *viz.*, the increased price of wool, and the high value of skins.

The imports of foreign stock into London have been extensive for the time of year, or as follows:

	Head.
Beasts .....	2,999
Sheep .....	10,092
Lambs .....	69
Calves .....	1,567
Pigs .....	60

Total . . . . . 14,787

During the corresponding month in 1852 they amounted to 5,444; in 1851, 10,289; in 1850, 4,667; in 1849, 3,810; in 1848, 5,391; and in 1847, 5,826 head.

The general quality of the stock has turned out tolerably good. From Hamburg, large numbers of Merino sheep have made their appearance, and which are included in the above return.

The annexed supplies have been exhibited in Smithfield:—

	Head.
Beasts .....	19,863
Cows .....	477
Sheep and lambs .....	115,830
Calves .....	1,891
Pigs .....	2,245

COMPARISON OF SUPPLIES.

	April, 1850.	April, 1851.	April, 1852.
Beasts .....	16,765	16,674	18,089
Cows .....	414	304	418
Sheep and lambs . .	97,920	108,824	101,374
Calves .....	1,299	1,152	1,500
Pigs .....	1,900	2,510	2,580

Out of the 19,863 beasts shown in the month just concluded 8,800 were derived from Norfolk, Suffolk, Essex, and Cambridgeshire, 3,500 from other parts of England, and 1,790 from Scotland; the remainder of the total supply being drawn from the neighbourhood of the metropolis and the continent.

The highest and lowest figures have ruled thus: Per lbs., to sink the offal.

	s.	d.	s.	d.
Beef, from .....	3	0	to	4 4
Mutton .....	4	0	to	5 4
Lamb .....	5	0	to	6 4
Veal .....	3	4	to	4 6
Pork .....	3	0	to	4 4

COMPARISON OF PRICES.

	April, 1850.			April, 1851.			April, 1852.		
	s.	d.	s. d.	s.	d.	s. d.	s.	d.	s. d.
Beef .. from	2 4	to	3 6	2 2	to	3 8	2 2	to	3 6
Mutton . . .	3 0	to	4 6	3 2	to	4 6	2 6	to	4 2
Lamb . . . .	3 8	to	5 8	4 10	to	6 0	4 4	to	5 6
Veal . . . . .	3 0	to	3 8	3 0	to	4 0	3 0	to	4 2
Pork . . . . .	3 2	to	4 0	3 0	to	3 10	2 6	to	3 10

The arrivals of country-killed meat up to Newgate and Leadenhall markets have been seasonably extensive. In the early part of the month the trade ruled very firm, at higher rates; but towards its close it was less active. Beef has sold at from 2s. 8d. to (in some instances) 3s. 10d.; mutton, 3s. 6d. to 4s. 6d.; lamb, 4s. 10d. to 6s. 4d.; veal, 3s. 4d. to 4s. 4d.; pork, 3s. 4d. to 4s. 6d. per lbs. by the carcass.

## UPPER FEMBRIDGE AND LOWER CARDIGANSHIRE.

Many continued planting potatoes even through the frost, and strange to say, it has not affected their growth, as they are showing above ground in many places. Oats which were sown at the same time are coming up well and look very promising. Precaution against injury to young potatoes has been taken by covering the plants with straw, which has had the desired effect. The change in our markets is most surprising; farmers some short time back were not asked the price of their produce when exposed for sale at market; now, not an article of produce but fetches extreme prices.—Young pigs eleven weeks old sell as high as 15s. each, and other stock in proportion. Places on high elevation are to this time (April 23) very backward in pasture, indeed but few places are yet forward but such as are well sheltered from the keen wind and well kept from sheep and cattle. Corn is not very much behind last year; sowing will be over about the end of this month in almost all places here. Potato planting is nearly over now. Winter corn is looking well, and we hear of no complaints. Clovers of last year are looking remarkably well. We have some fine showers, but the weather is not very warm yet. It is surprising that although of the potatoes that were pitted for keeping, many rotted, yet, young potatoes were produced in the earth from the rotten ones. The weather is now fine, and vegetation very forward, and all corn and other seeds that were grounded are coming up fast. But we have not heard the cuckoo yet.—April 23.

## DUMFRIES.

Up till Friday last the weather continued dry and cold, a withering wind blowing from the east, and checking even the slight vegetation which had accompanied the advent of the middle of April. Since Friday, when the wind veered to the south, where or in the west it has since continued, the air has been decidedly milder, though still too cold at night; occasionally slight showers have fallen, and though the sun has been generally veiled by clouds, considerable stimulus has been given to vegetation, and the pasture fields have made welcome and obvious progress. In sheltered situations the thorn hedges and larch trees are assuming the livery of spring; the yellow primrose expands its flower on the mossy banks; and the flowering currant shows its beautiful pink clusters in abundance, tempting the bees to labour, which they yet perform but languidly. In the arable land a great deal of work has been done, for which, with all its drawbacks, the month of April has hitherto been very favorable, and in this locality oat sowing has been nearly concluded, and potato planting more than half accomplished; while, generally, the seed has been deposited in excellent order. Much will, of course, depend upon the character of the summer, but undoubtedly the spring has been an unusually late one, and an extra amount of solar heat will be necessary to bring the harvest in point of

time, at least up to an average. As a proof of this it may be mentioned, that one of the most active farmers in lower Nithsdale had not sown a single oat-field until after April had commenced—a circumstance without a parallel in his remembrance, which now extends over a lengthened series of years. The lambing season has now nearly concluded in the parks, is well advanced on the braes, and commenced among the hills last week. Though on many farms park ewes and lambs have thriven well and doubles been common, on others, especially on the colder lands, the loss of both has been considerable; some breeders having suffered very severely indeed. From the braes the accounts are equally conflicting; from the glens, which centre at Minnyhive, we learn that the season has been favourable hitherto, the lambs average in number, and few dying; while on the other hand, from a somewhat high region in middle Annandale, we have the following note:—"My shepherd tells me this morning that he does not remember a worse lambing season for hill stock. Allowing a little for exaggeration, I must still conclude that the season has been, and is very unpropitious. There is no spring yet in the grass, and my crop of lambs will certainly be under the average." Last week we had an opportunity of conversing with various extensive flockmasters, whose hirsels roam over the Dumfries-shire highlands, and, though they all confessed to regarding the approaching season with considerable anxiety, they were more hopeful than could have been expected, looking to the low condition to which so many ewes have been reduced. Save here and there, where a heavy wreath still defies the sun and showers of April, the snow has disappeared from the hills; the grasses had begun to come away at last, and by the time we write must have improved considerably. But, indeed, scarce as food is, a sudden rush of vegetation is by no means desirable, as being apt to superinduce disease in the ewes, the weakening effects of which they are not at present in a condition to stand. The letting of grass parks will be general this week, and growing weather has come barely in time to give the fields an appearance of greenness. The rates given last year were unusually high, but the greatest prices at present current for stock will have a tendency to lessen the demand for keep. A few rousps have already taken place in this neighbourhood; in some instances the lets realized were rather less than last year, while in others, again, they were fully maintained. From Annandale we have the following information on this subject: The grass parks on the beautiful and highly improved property of Rosebank, in the vicinity of Lockerby, extending to 50 acres, were let recently for no less than £200—a portion of which was young grass. The parks at Ladyward maintained fully last year's prices, averaging £3 10s. 9d. per acre. The parks at Castlemilk and underwood were let at higher rates than last year. At Woodhouse, yesterday, there was an excellent let at higher rates than last season; and some medium half-bred hogs made 36s. 6d.—*Dumfries Courier*.

## REVIEW OF THE CORN TRADE DURING THE MONTH OF APRIL.

The Chancellor of the Exchequer has at length brought his budget before the House of Commons. We are not about to pass an opinion on its various details, but we cannot help remarking that the position of the owners and occupiers of land—certainly one of the most, if not the most important

interest—receive no notice. The two preceding governments, that under the premiership of Lord John Russell and that headed by the Earl of Derby, acknowledged and deplored the injury which farmers and landowners had sustained by the new commercial legislation; and the latter

endeavoured in some way to afford relief to a body who have been made to suffer by a policy deemed to work beneficially for the rest of the community. Mr. Gladstone proposes no remedial measures whatever; indeed, he contemplates obtaining an increased resource from the land, in the shape of legacy duty. It is not very probable, therefore, that his government will meet with much support from members representing agricultural counties.

We have no intention of trenching further on our space, in reference to this matter: our agricultural friends must judge for themselves how far they are likely to be benefited by the proposed new measures.

The weather during the first three weeks in the month now about to terminate was auspicious for field labours, and the utmost activity prevailed. Some of the land intended to have been sown with wheat in the autumn, but which was then flooded and afterwards frozen too hard to allow of anything being done with the same till towards the latter part of March, has, so soon as it could be brought into tolerable condition, been seeded with the corn for which it had been originally designed; but in many cases, farmers have deemed it too hazardous to put in wheat so late, and the land has consequently been devoted to other purposes. The entire breadth is certainly short of average years—how far short cannot be very accurately estimated, but the best authorities compute it at 15 to 20 per cent. below the usual average. The autumn-sown wheat is generally described as healthy in appearance: of that lately committed to the soil little can at present be said, as it has hardly as yet appeared above ground. The sowing of Lent corn was not generally commenced till considerably after the accustomed time; since the latter part of March, the weather has, however, been very favourable: the drying winds in the early part of the present month absorbed much of the superfluous moisture, and field labours were not once checked till the 22nd inst., by which time the greater part of the seed had been got in. Lately we have had heavy rain, which has rendered the land too wet to be advantageously worked, and where sowing was not previously completed, further delay has been the consequence. The rain in other respects must be regarded as likely to prove beneficial; and should it be followed by increased heat, vegetation would be rapidly brought forward.

The tone of the grain trade was excessively dull in the beginning of the month; and though a slight improvement has occurred within the last eight or ten days, still there appears to be a great want of confidence in regard to the future. The fact is that the extent of the foreign importations have

upset all previous calculations; and it becomes more and more evident that prices in this country must in future depend more on the opinion entertained abroad as to what the growers there may consider remunerating rates, than on the result of our own crops. The supplies from the Black Sea ports increase steadily from year to year, and it is plain that the resources of Southern Russia as a producing country are not yet fully developed. The pressure which has been felt since the commencement of the present year has been principally caused by the extent of the arrivals from the quarter alluded to, by far the greater portion of the importations having been from ports east of Gibraltar. From the Baltic and other Northern European ports, comparatively little corn has reached us the last three months; but we have had liberal receipts of flour from America, France, and Spain. Under these circumstances the indifferent result of the last harvest in Great Britain has not been followed by the effects anticipated, and those who calculated on high prices have met with disappointment; indeed, since the close of 1852 the tendency has been constantly downwards. As a proof, however, that the inferiority of the quality of our own crop was not exaggerated, we may direct attention to the fact that good serviceable millers' wheat has been scarce for months past; and the ordinary qualities having been unfit for use without a large mixture of foreign, the stocks of the latter have been so extensively drawn upon that very little good Baltic wheat now remains in granary, and our present resources are confined almost wholly to Black Sea sorts, which our millers do not like, but are now obliged to use. To this state of things we attribute the slight improvement which has taken place in the tone of the trade, within the last week or two. There has certainly been no speculation, but the consumption has been and is likely to continue large; and unless we are again inundated with foreign supplies, a moderate rise does not appear improbable, even though the seasons should prove propitious, and the crops on the ground progress favourably. At the same time we must admit that our confidence is not very great: at the present moment there are upwards of a score of large cargoes of Black Sea wheat off Falmouth and Queenstown, undisposed of; and shipments from the Baltic, as well as from some of the near continental ports, on rather a liberal scale, have been commenced. Good wheat will no doubt continue to be wanted; but the arrival at any time of more than may be immediately required will suffice, in the absence of anything like a speculative feeling, to cause a temporary pressure.

Stocks of English barley are evidently exhausted in all parts of the kingdom: this grain has throughout commanded relatively better prices than wheat,



which has encouraged farmers to cultivate it somewhat more extensively this season than usual; and where the land is adapted for its growth, it has been substituted for wheat. The seed demand has been active this month; and though many of the maltsters have finished their purchases some time ago, fine qualities of barley have, up to the present period, commanded very full terms at the principal consuming towns, as well as at most of the markets in the agricultural districts.

Oats, beans, and peas have scarcely varied in value. Of the former article, stocks are very small on this side of the channel, but in Ireland a fair portion of the last abundant crop still remains on hand; whether any great quantity will however be sent to England appears doubtful, the consumption of oatmeal being larger than usual, owing to the scarcity of potatoes.

We shall now proceed to give our usual retrospect of the transactions which have taken place at Mark Lane during the month. The neighbouring farmers having been busily engaged in the fields, the supplies of most kinds of home-grown corn have been on a very moderate scale. The arrivals of wheat coastwise into the port of London have hardly averaged 3,000 qrs. per week, and the receipts per rail have also been small. The dry weather in the early part of the month had a beneficial effect on the condition, and the samples from Essex and Kent have in general come to hand in rather better order than before. The millers have, however, acted with so much caution as to render it impossible to establish any advance; indeed a decline of 1s. per qr. had to be submitted to, on the 11th inst., which reduction has been only partially recovered since then. The supplies from Lincolnshire and Cambridgeshire have fallen off materially, the east coast shippers having directed their wheat to the northern markets in preference to London. Within the last fortnight a few hundred quarters of red Kentish wheat have actually been brought here for shipment to Wakefield, being the first purchase of the kind for that destination since the beginning of the year. Quotations at present are much the same as they were at the close of March. Our millers do not hold any stocks of importance, and should the country demand increase, they might experience some difficulty in obtaining a sufficiency of fresh wheat to keep their mills going.

A very large proportion of the 76,235 quarters of foreign wheat received has been from the Black Sea and Mediterranean. These sorts have been very difficult of disposal; and importers have been forced to land, it having been impossible to sell largely from on board ship. Whilst Baltic qualities have, in consequence of their scarcity, rather improved than receded in value, southern wheats have

been offered in vain at a reduction of 1s. to 2s. per qr. The fact is, that the London millers are not by any means partial to these descriptions, which are better adapted for the provincial markets, where colour is not so much thought of as in the metropolis. Arrived cargoes of Polish Odessa wheat might now be bought at 35s. to 40s. per qr., duty paid; and cargoes off the coast have lately been offered at 36s. to 37s. per qr., cost and freight, without meeting with much attention. The finer kinds, such as Marianople and Berdianski, which a month ago were worth 44s. to 45s., are now obtainable at 42s. to 43s. per qr., and other descriptions at proportionate rates. There are between twenty and thirty large cargoes off the coast undisposed of. There has been no disposition to buy Baltic wheat free on board; and comparatively little has been done in this branch of business during the month, though some of the offers from that quarter have been rather tempting. The Danzig merchants have not been pressing sellers; but from some of the lower ports there have been offers at prices which would almost leave a small margin for profit on present quotations. The check which the dull state of things here is calculated to give to shipments from foreign ports may have its influence hereafter, inasmuch as it will cause the supplies in the first instance to be considerably less than they would have been if our markets had held out more inducement to consign.

The value of town-manufactured flour has undergone no change since our last; the sale has been materially interfered with by the pressure of foreign on the market. An attempt has been made to establish sales of the latter by public auction, but has not succeeded, the bids having been deemed so unsatisfactory that the whole put up was bought in. In addition to 39,534 barrels from America, we have received 16,813 sacks from European ports, principally those of France and Spain. Importations of Spanish flour may be considered as a new feature. The quality of this flour is very fine, and stands quite as high in the estimation of buyers as the best French. Some is worth as much as 40s. to 42s. per sack, being only a few shillings below the top price of London whites. American flour was very pressingly offered in the early part of the month. Sour was in some instances sold as low as 21s., and good brands at 23s. to 24s. per brl. Within the last week or two a better demand has sprung up, and a slight disposition has been shown to buy the article to hold over.

English barley has come to hand very sparingly, and notwithstanding the advanced period of the season, the inquiry for this grain has been tolerably active. The coldness of the weather has probably induced the maltsters to work later than they would

have done if the temperature had been higher. There has, at all events, been no difficulty in placing fine qualities, and even the commoner sorts have met with a fair share of attention. The prices previously current have consequently been well supported; and we consider this grain quite as dear as it was when we last addressed our readers. Good foreign barley for grinding has likewise been in fair request; the stock of Danish and similar kinds in granary has been nearly exhausted, and the few small lots which have reached us from near continental ports have been placed easily at rates fully equal to those current at the close of last month.

The arrivals of Egyptian barley have been tolerably good; but the extreme scarcity of other descriptions has rendered the sale less difficult than it might otherwise have been, and 22s. to 23s. per qr. has been obtained for cargoes in good condition.

The scarcity of fine barley has naturally influenced the value of malt, and superior samples of the latter have commanded high prices. This does not, however, seem to have lessened the consumption, and we believe that the stocks in brewers' hands are not larger than usual at the corresponding period of the season.

The arrivals of oats coastwise into the port of London have been very small, and the total quantity received from all quarters, including foreign, during the four weeks ending the 23rd inst. has amounted to only 64,878 qrs. This gives an average supply of 16,200 qrs. per week, whilst the consumption of the metropolis is at from 22 to 25,000 qrs. per week. The deficiency has been partly made good by supplies received by the different railways; still rather serious inroads have been made on the stocks in dealers' hands, and the market has become bare of good corn. Purchasers have confined their operations to as narrow limits as their immediate and pressing wants have allowed, and the trade, though firm, has not at any period of the month been active. In this position of affairs, factors have been unable to establish any advance, and quotations remain very nearly the same as when we last addressed our readers. Of English oats there are scarcely any remaining; of Scotch we have still some quantity in granary, and it is difficult to exceed 22s. per qr. for good feed. Irish are more plentiful than other sorts, and range in value from 17s. up to 21s., according to weight and shape. Russian feed oats have moved off in retail at 20s. to 21s., Danish and Swedish at similar terms, and Dutch Polands and brews at 19s. to 21s. per qr. The unwillingness which the large dealers have exhibited to buy, may be attributed to the knowledge that a fair supply is on passage from the

near continental ports; but stocks have now become so closely worked up, that it may be questioned whether the expected arrivals, when they do come to hand, will cause any decline in prices. The latest accounts from Holland inform us that the shipments for England would not be important local buyers, having paid more for the article than had been offered by the export houses.

The supplies of home-grown beans, though small, have proved about equal to the demand, and quotations have undergone little or no change since our last. A few cargoes of Egyptian beans have come to hand, but sellers have remained firm, and the article has not been offered below 26s. 6d. to 27s. per qr. cost and freight. For parcels in granary, 29s. to 30s. has been demanded, at which there has been a moderate sale. The operations in peas have been on a strictly retail scale, and no alteration requiring notice has taken place in prices.

Though the arrivals of Indian corn off the coast have been considerable during the last two or three months, a steady demand on Irish account has prevented anything like pressure being felt; indeed, of late the enquiry has outstripped the supply, and the tendency of prices has, within the last week or two, been decidedly upwards, 32s. to 33s. per qr. cost and freight having been paid for arrived cargoes of Galatz, and corresponding rates for other descriptions. Indian corn is evidently progressing steadily in favour as an article of food in Ireland, and the annual consumption is likely to increase.

The remainder of our space we must devote to a short notice of the position of affairs (up to the time of our latest advices) at the different foreign markets, the direct influence which prices abroad now have on those at home rendering it important that those connected with the corn trade, whether as producers or consumers, should be kept regularly informed of the changes which from time to time occur in other parts of the world.

The opinion we ventured to express last month, as to the period we deemed it probable the navigation of the northern rivers and harbours would remain closed by ice, has proved correct. Some of the Lower Baltic ports became free about the middle of the month; but letters from Danzig, Königsberg, &c., of as recent a date as the 22nd, state that the harbours were not then quite free from ice. So late an opening of the navigation has not occurred for some years past, and the spring shipments will consequently be delayed considerably beyond the usual period. Some of our correspondents express apprehension as to what effect may have been produced on the seeds in the ground by so protracted a winter, more especially as the changes in the temperature have been very great. At one time there was a rapid thaw, and

an interval of comparatively warm weather, sufficient to stimulate vegetation; this having been succeeded by severe frost, it is certainly not unreasonable to suppose that some mischief may have resulted therefrom.

Under these circumstances, foreign merchants have not been much disposed to lower their pretensions; and though the tendency of prices has on the whole been downwards at several of the principal ports, the decline has not been sufficient to lower quotations in proportion to ours, and at present there is no margin for profit on shipments to England. The latest reports from Danzig state the really fine high-mixed wheat, weighing 61½ to 62lbs. per bushel, was still worth there 46s. per qr. free on board. The lower descriptions were relatively cheaper, as only a small proportion of the stock consisted of the former; fine high-mixed, weighing 61½ lbs. might have been bought at 44s., and good mixed at 60lbs. 43s. per qr. free on board.

At Königsberg, on the 21st inst., the harbour was still covered with ice. Moderate supplies of wheat had been brought forward, but there had been no disposition to press sales. For good and fine qualities in granary, holders had continued to ask full prices, say 46s. for superior high-mixed weighing 62lbs., 42s. for good mixed 61½lbs., and the same price for 62lbs. red. Freights were much the same as before, say 4s. 3d. per qr. for London or Hull.

From Stettin we learn that holders of wheat, who had in the early part of the month been a good deal influenced by the very dull accounts from hence, had regained confidence, and prices recovered 1s. to 2s. per qr. from the lowest point of depression. Rather considerable purchases have been made at that port on British account during the winter, and it was estimated that when these should have been despatched, the stock will not be heavy. Of the quantity bought there, only a comparatively small proportion is stated to be for London, many of the cargoes being destined for Leeds, Hull, and some for Scotland.

Quotations were, on the 22nd inst., for good 61½lbs. red 40s., and for fine 62lbs. white Polish 43s. to 44s. per qr. free on board. At Rostock, prices have been well supported throughout the winter, the wheat shipped from thence continuing to hold the high place in the estimation of our millers which it has so long commanded. Stocks are reported to be only moderate there, more especially of fine qualities, and the very best samples could not, according to the latest advices, have been put on board below 44s., whilst good 61½ to 62lbs. parcels had sold at equal to 42s. to 43s. per qr. free on board.

At Stralsund, in the neighbourhood of which place a similar quality of wheat is produced, prices were not quite so high, as our buyers invariably give the preference to shipments from Rostock. Taking the Lower Baltic ports generally, good heavy red wheat may be said to range in value from 42s. to 43s. per qr.

The river Elbe became navigable for steamboats about the middle of the month, and subsequently sailing vessels have managed to get away. A few parcels of wheat shipped by the steamers have been received from Hamburg here and also at Hull—the quality only moderate. The latest quotations from thence are, for red Upland, weighing naturally 58½lbs. per bushel, but made up 60lbs., 42s. 3d., and Marks wheat of 60½lbs. 43s. 3d. per qr. free on board. From out-ports there had been few offers; barley had rather receded in value, but oats had met a lively sale at previous prices.

At some of the Dutch markets wheat declined several shillings per qr. the first fortnight in April, and this reduction has since been only partially recovered. The quality of last year's wheat in that country is even worse than our own, and there is consequently little inducement to buy there except at very low rates. The new white Zealand, brought to Rotterdam for sale, has ranged in weight from 56 to 59lbs. per bushel, and the few lots which have been shipped to London have come to hand in very soft condition, being damp and badly sprouted. Such wheat has been sold at Rotterdam for 34s. to 36s. per qr. free on board, and even at these low prices has left no margin for profit.

In Belgium good wheat is beginning to get very scarce, and it is deemed probable that that country may have to import from Germany &c.

France has thus far shown no signs of want, and it would therefore appear that the last crop proved better than was estimated at harvest time. During the month the supplies brought forward at the different French markets have been in excess of the demand, and prices have consequently tended downwards. At Paris, flour receded 1 f. per sack three consecutive weeks. Many appear, however, still to question whether stocks may not run short there during the summer.

From the Mediterranean we have nothing of much interest to communicate. At Marseilles stocks of Black Sea wheat are stated to be short, and Polish Odessa and similar sorts are relatively dearer there than in the British markets. In Italy the weather appears to have been rather unseasonable, but it was deemed too early to say much about the probable result of the crops. At Leghorn, Trieste, &c., prices of wheat have not varied materially since our last monthly notice.

The latest advices from the Black Sea state that a large fleet of vessels had arrived out, and the necessity to provide cargoes for the same had caused an active enquiry for wheat at the principal ports. Galatz letters of the 7th April state that nearly the whole of the available stocks had been cleared off, and that previous prices had been well maintained. Further supplies on rather a liberal scale were, however, expected from the interior, or quotations would probably have gone higher. Galatz wheat was then worth 24s. 6d. to 25s. 6d., and Ibraila 23s. 6d. to 24s. 6d. per qr. free on board. Freight to the United Kingdom by British vessels had declined to 12s. 3d., and foreign ships had been offered at 12s. per qr.

From America we have letters of recent dates. The stocks at the principal ports on the coast were not considered heavy, and though the export demand had not been particularly active, previous prices had been well maintained; indeed, at New York the tendency had been upwards, and quotations were higher there on the 7th April than at the date of sailing of the previous steamer.

New Orleans letters, of the 2nd inst., state that the dull account from hence had had a good deal of effect, and flour had become easier to buy after the receipt of the English letters. Quotations were then for fair qualities of flour 17s. to 18s. At these rates, a good many purchases had been made for shipment to England, and ship room had been engaged for about 10,000 barrels, at 5s. per barrel for Liverpool.

CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter	
WHEAT, Essex and Kent, white, new...	42 to 47	fine up to 52
Ditto ditto old	44	52
Ditto ditto red, new...	42	45
Ditto ditto old	41	48
Norfolk, Lincoln, & Yorksh., red...	42	47
Ditto ditto new	37	44
Ditto ditto white new, none		
Ditto ditto old		none
BARLEY, malting, new...	30	32
Distilling	28	30
MALT, Essex, Norfolk, and Suffolk, new	54	55
Ditto ditto old	52	54
Kingston, Ware, and town made, new	59	60
Ditto ditto old	57	59
OATS, English feed...	17	21
Scotch feed	20s. 6d.	25
Irish feed, white	17	19
Ditto, black	16	17
RYE	28	30
BEANS, Mazagan	33	34
Ticks	34	36
Harrow	35	37
Pigeon	36	40
PEAS, white boilers	37	40
Maple	33	36
Grey	30	35
FLOUR, town made, per sack of 280lbs.		39
Household, Town 40s. Country		35
Norfolk and Suffolk, ex-ship		32

FOREIGN GRAIN.

	Shillings per Quarter	
WHEAT, Dantzic, mixed...	46 to 47	high mixed 49 51 extra 57
Konigsberg	45	47
Rostock, new	48	50
Pomer., Meckbg., and Uckermk., red	46	48
Silesian	44	46
Danish and Holstein	42	41
Rhine and Belgium	42	45
French	42	44
Odessa, St. Petersburg and Riga	37	39
BARLEY, grinding	21	28
Malting		none
OATS, Dutch, brew, and Polands	19s. 21s. 6d.	Feed 17s. 6d.
Danish and Swedish feed	19	20
Russian	20	21
BEANS, Friesland and Holstein		32 35
Konigsberg	34	37
PEAS, feeding	35	36
INDIAN CORN, white	32	35
FLOUR, French, per sack	34	37
American, sour per barrel	21	23

IMPERIAL AVERAGES.

	FOR THE LAST SIX WEEKS.											
	Wheat.		Barley.		Oats.		Rye.		Beans		Peas.	
WEEK ENDING:	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
March 12, 1853.	45	8	31	9	18	6	30	9	34	4	32	9
March 19, 1853.	45	5	31	9	18	10	30	10	34	2	32	11
March 26, 1853.	44	9	31	10	18	9	33	0	34	3	32	6
April 2, 1853.	44	4	31	6	19	0	30	5	34	8	32	5
April 9, 1853.	44	9	31	4	18	9	31	10	34	5	32	10
April 16, 1853.	44	10	31	11	19	0	29	10	34	3	33	7
Aggregate average of last six weeks	41	11	31	8	18	10	31	1	34	1	32	10
Comparative ave. same time last year	41	11	29	10	19	7	31	10	30	1	29	8
DUTIES	1	0	1	0	1	0	1	0	1	0	1	0

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last Friday's Gazette.		Averages from the corresponding Gazette in 1852.	
Qrs.	s. d.	Qrs.	s. d.
Wheat	75,972	41	10
Barley	29,751	31	11
Oats	16,333	19	0
Rye	130	29	10
Beans	4,376	34	3
Peas	730	33	7

DIAGRAM SHOWING THE FLUCTUATIONS IN THE AVERAGE PRICE OF WHEAT DURING THE SIX WEEKS ENDING APRIL 16, 1853.



PRICES OF SEEDS.

BRITISH SEEDS.

Linsced (per qr.)	sowing 54s. to 58s.; crushing 45s. to 50s.
Lansced Cakes (per ton)	£8 0s. to £9 10s.
Rapeseed (per last) new	£22 to £23. fine £24, old £21 to £24
Ditto Cake (per ton)	£4 10s. to £5 0s.
Cloverseed (per cwt.)	44s. to 64s.
Mustard (per bushel) new, white	7s. to 9s., brown 7s. to 9s.
Corian ler (per cwt.)	old 9s. to 12s.
Canary (per qr.)	40s. to 42s.
Tares, Winter (nominal)	Spring, per bush. 1s. 6d. to 5s. 6d.
Carraany (per cwt.)	new 16s. to 17s.; fine 48s.
Turnip, white (per bush.)	Sweden (nominal)
Trefoil (per cwt.)	33s. to 25s.
Cow Grass (per qr.)	(nominal) 00s. to 00s.

FOREIGN SEEDS &c.

Linseed (per qr.)	Baltic, 43s. to 46s.;	Odeasa, 45s. to 49s
Linseed Cake (per ton)	27 10s. to 29 10s	
Rape Cake (per ton)	24 10s. to 25 0s	
Hempseed, small (per qr.)	38s. to 42s., Do. Dutch, 40s. to 42s	
Tares (per qr.)	old, small 30s. to 35s., large 36s. to 42s	
Rye Grass (per qr.)	28s. to 35s.	
Coriander (per cwt.)	12s. to 14s.	
Clover, red (duty 5s. per cwt.)	46s. to 53s.	
Do. white (duty 5s. per cwt.)	52s. to 65s.	

HOP MARKET.

BOROUGH, MONDAY, April 25.

We have a small inquiry for the better class of Hops, at about late rates.

Mid and East Keats	115s. p. 160s.
West of Keats	110s. p. 126s.
Stassow	105s. to 120s.

CHICORY.

SATURDAY, APRIL 25.

Notwithstanding that the stocks in the hands of the dealers are comparatively limited, the demand for both English and foreign Chicory is in a sluggish state. Prices, however, are well supported. At least two-thirds of the supply in the metropolis are in the hands of large holders. We are without any foreign arrivals.

Foreign root (d.p.)		Per ton.		Roasted & ground	
£ s.	£ s.	£ s.	£ s.	£ s.	£ s.
Hortling	31 0 32 0	English	37 0 40 0		
English root (free)		Foreign	46 0 48 10		
Guernsey	13 10 15 15	Guernsey	49 0 42 0		
York	14 0 16 0				

Duty on all Coffee and roasted Chicory imported, 3d. per lb.: on Chicory Root £21 per ton.

POTATO MARKETS.

SOUTHWARK, WATERSIDE, MONDAY, April 25.

During the past week this market has been fully supplied, both coastwise and by rail, and many parcels being left unsold from the previous week, has caused a further decline in prices, and very dull trade.

The following are this day's quotations:—

York Regents	per ton	100s. to 160s.
Lincolnshire ditto		90s. " 120s.
Scotch ditto		100s. " 120s.
Ditto Reds		80s. " 90s.
French whites		80s. " 100s.

BOROUGH AND SPITALFIELDS.

The imports of Potatoes into London last week were seasonably good, viz., 451 tons from Rouen, 33 from Gravelines, 46 from Dunkirk, 28 from Erguy, 66 from Nantes, 210 from Rotterdam, 45 from Calais, 10 from Bordeaux, 72 from Pont L'Abbe, and 54 from Jersey. The demand for all kinds is in a very inactive state. Present rates as follows:

York Regents	115s. to 165s. per ton.
Lincolnshire do.	100s. to 125s. "
Scotch do.	100s. to 125s. "
Foreign	90s. to 110s. "

COUNTRY POTATO MARKETS.—LEEDS, April 19: Potatoes, of which there was a fair supply, were sold wholesale at 1s. 4d. to 1s. 4½d., and retail at 1s. 5d. to 1s. 6d. per 21lbs. —MANCHESTER, April 19: Potatoes, 14s. to 18s. 6d. per 252lbs.

BARK.

English Tre	per load of 45 cwt. £11 0 0 to £11 0 0
Coppice	19 0 0 15 0 0
Mimosa	per ton 9 0 0 10 0 0
Valonia	11 0 0 10 0 0

COVENT GARDEN MARKET.

SATURDAY, APRIL 23.

The supplies of Vegetables are improving, but still they are no more than sufficient for the demand. A few better Peaches have made their appearance during the week. Hothouse Grapes have not altered in price since our last report, and the same may be said of Pineapples. Forced Strawberries fetch from 9d. to 1s. 6d. an ounce. Cob and other Nuts bring fair prices. The supply from the Continent of Green Peas, new Potatoes, Iron Carrots, A-paragins, Radishes, Globe Artichokes, Endive, and Lettuces, is still considerable, and the various articles are excellent in quality. Both Sea-kale and Rhubarb are pretty abundant. Potatoes are dear. Mushrooms are scarce. Cut flowers consist of Hyacinths, Primulas, Tulips, Roses, Cyclamens, Mignonette, Cucarinas, and Camellias.

FRUIT.

Peaches, per lb.	8s. to 12s.	Oranges, Sic., p. 10, 7s. to 14s.
Grapes, hothouse, p. lb.	10s. to 15s.	Lemons, per doz., 1s. to 2s.
Strawberries, per doz.	6d. to 1s. 6d.	Almonds, per lb., 5s.
Apples, des., p. bush.	10s. to 15s.	" sweet, per lb., 2s. to 3s.
" kitchen, do., 6s. to 12s.		Nuts, havelock, per bush, 20s.
Oranges, per doz., 1s. to 2s.		" Cobs, 12s.
		Chestnuts, per bush, 8s. to 20s.

VEGETABLES.

Cabbages, per doz., 1s. to 2s.	Leeks, per bunch, 3d. to 4d.
Brussels Sprouts, per hf. sieve, 2s. to 3s.	Shallots, per lb., 6d. to 8d.
Broccoli, per doz., 2s. to 4s.	Garlic, per lb., 6d. to 8d.
Greens, per doz., 4s. to 6s.	Lettuces, Cos, p. doz., 6d. to 1s. 6d.
French Beans, per 100, 1s. 6d.	" Cos, per score, 1s. to 2s.
Asparagus, p. bundle, 5s. to 10s.	Radishes, per doz., 2s. to 2s. 6d.
Sea-kale, p. bush, 2s. to 2s. 6d.	Endive, per score, 2s. 6d. to 3s.
Rhubarb, p. bun., 6d. to 1s.	Small Salads, p. bun., 2d. to 3d.
Potatoes, per ton, 85s. to 150s.	Horseradish, p. bun., 1s. to 1s. 6d.
" per cwt., 5s. to 9s.	Mushrooms, p. pot., 1s. 6d. to 2s.
" per bush, 2s. 6d. to 5s.	Sorrel, p. hf. sieve, 6d. to 1s.
Turnips, per doz., 3s. to 4s.	Artichokes, Jer. do., 1s. to 1s. 6d.
Cucumbers, each, 6d. to 2s. 6d.	Fennel, per bunch, 2d. to 3d.
Celery, p. bundle, 9d. to 1s. 6d.	Savory, per bunch, 2d. to 3d.
Carrots, per doz., 6s. to 8s.	Thyme, per bunch, 2d. to 3d.
Sprouts, per sieve, 2s. to 3s.	Parsley, p. doz. bunches, 3s. to 5s.
Onions, p. bushel, 4s. to 5s.	Mint, green, per bunch, 6d. to 9d.
" Spanish, per doz., 3s. to 5s.	Basil, per bunch, 1s.
Beet, per doz., 1s. to 1s. 6d.	Marjoram, do., 1s.
	Watercress, p. 12 bun., 8d. to 10d.

ENGLISH BUTTER MARKET.

MONDAY, April 25.

We still note a good trade in Butter, and prices are maintained.

Dorset, fine weekly	102s. to 104s. per cwt.
Do. middling	88s. to 96s. " "
Fresh, per doz. lb	10s. to 12s.

PRICES OF BUTTER, CHEESE, HAMS, &c.

Butter, per cwt.	£ s.	Cheese, per cwt.	£ s.
Freehold	98 to 100	Cheshire	60 to 68
Kiel	16 1 0	Cheddar	60
Dorset	100 100	Double Gloucester	60 68
Cardon	92 96	Single do.	54 62
Waterford	90 92	Homs, York, new	84 94
York	90 96	Westmoreland	89 10
Limerick	86 91	Irish	65 78
Sligo	86 94	Bacon, Wiltshire, green	68 70
Fresh, per doz.	11 13	Waterford	62 66

BELFAST, (Friday Inst.)—Butter: Shipping price, 93s. to 102s. per cwt.; firkins and crocks, 10½d. to 10½d. per lb. Bacon, 5s. to 5s.; Hams, prime, 70s. to 74s.; second quality, 60s. to 64s per cwt.; mess Pork, 80s. to 90s. per brl. Irish Lard, in bladders, 66s. to 70s.; kegs or firkins, 64s. per cwt.

April	Butter, per cwt.	Bacon, per cwt.	Dried Hams, per cwt.	Mess Pork, per brl.
14.	8. d. s. d.	8. d. s. d.	8. d. s. d.	8. d. s. d.
1850	7 0 26 0	4 8 0 50 0	6 8 0 7 0	7 7 0 80 0
1851	7 0 84 0	4 8 0 10 0	6 8 0 7 0	7 7 0 77 0
1852	8 0 90 0	4 8 0 44 0	6 8 0 6 0	6 0 62 0
1853	7 0 78 0	4 8 0 46 0	6 6 0 5 0	6 0 67 0
1853	9 3 102 0	5 0 0 58 0	5 0 0 7 4 0	80 0 99 0

WOOL MARKETS.

BRITISH WOOL MARKET.

LONDON, April 25.—Since our last report, the business doing in all kinds of English wool has been limited; nevertheless, prices have ruled about stationary. We understand that offers to deliver wool at present rates have come forward rather freely from the provinces; but we much doubt whether the foreign orders at this time on hand will be executed, as they are at too low a limit. The consumption of English wool is evidently still on the increase, and, in our opinion, there is ample room for a further decided improvement in its value. Some parties contend that the clip, this year, will be a full average one. We have great reason to doubt the correctness of the statement from the all-important fact that we have a much smaller number of sheep in the country than for a series of years past.

CURRENT PRICES.

	s. d.	s. d.
South Down Hoggets	1 4	to 1 6
Half-bred ditto	1 3½	— 1 5
Ewes, clothing	1 2	— 1 3
Kent fleeces	1 1½	— 1 3
Combing skins	1 1	— 1 4½
Fleeced wools	1 0	— 1 4
Blanket wool	0 8	— 1 0
Leicester fleeces	1 2	— 1 3

LEEDS, April 22.—There has not been any change of moment during the present week, either in demand or prices for English Wool.

LIVERPOOL WOOL MARKET, APRIL 23.

SCOTCH WOOL.—The demand for all kinds is good, and were stocks larger, more would be doing.

	s. d.	s. d.
Laid Highland Wool, per 24lbs.	13 0	to 14 0
White Highland do.	16 0	to 18 0
Laid Crossed do., unwashed	16 0	to 17 6
Do., do., washed	17 0	to 18 6
Laid Cheviot do., unwashed	18 0	to 20 0
Do., do., washed	20 6	to 23 0
White Cheviot do., do.	28 0	to 30 0

FOREIGN WOOL.—The public sales here on Wednesday, the 20th inst., were well attended: many, however, came down merely to see and find out the feelings and opinions of their neighbours as to the prospects of the new clip. The colonial lately landed in splendid condition from the "Great Britain" steamer from Sydney sold at fair prices. The East India and other low sorts went at an advance on former rates of about 1d. per pound. The stocks being light, there is little doing by private contract.

FOREIGN WOOL MARKET.

CITY, MONDAY.—The market for colonial and foreign sorts is exceedingly firm; and from the manner in which the Liverpool sales have gone off, there is every appearance of prices being supported.

BRESLAU WOOL MARKET, April 19.—Great excitement prevails in the wool market, all descriptions being in a continual request at very high rates. Nevertheless sales are confined to a quantity of 6 to 800 cwt. per week, owing to the scarcity of the article. The chief transactions have been effected in Silesian slipes at from 60 to 68 thalers per cwt.; skin-wool in bundles at from 76 to 85 thalers, middling fleeces at from 70 to 78 thalers, and refuse at from 52 to 62 thalers per cwt. The satisfactory result of the Leipzig cloth fair has already caused many manufacturers to visit our place on purpose to provide themselves with the rough material, still before the beginning of the new clipping; but the want of even a middling choice has prevented them making any purchases of consequence. The contracting business has been in the meantime of very great extent, and nearly 4,000 cwt. of all descriptions have been recently bought by home and foreign speculators at a rise of 8 to 12 per cent.—GUNSBERG, Wool-broker.

HIDE AND SKIN MARKETS.

	s. d.	s. d.	per lb.
Market Hides, 56 to 64 lbs.	0 2½	to 0 3	
Do., 64 72 lbs.	0 3	to 0 3½	
Do., 72 80 lbs.	0 3½	to 0 3¾	
Do., 80 88 lbs.	0 3½	to 0 3¾	
Do., 88 96 lbs.	0 3½	to 0 4	
Do., 96 104 lbs.	0 4	to 0 4½	
Horse Hides	5 6	to 6 0	each.
Calf Skins, light	1 6	to 2 6	
Do., full	5 0	to 0 0	
Polled Sheep	10 0	to 12 6	
Kents	10 0	to 11 6	
Half-breds	10 0	to 11 6	
Pores	7 0	to 9 0	
Shearlings	1 6	to 1 8	
Lambs	2 3	to 2 9	

TIMBER.

	£ s. d.	£ s. d.
Baltic Timber, per load of 50 cubic feet	3 7 6	to 4 0 0
Yellow Deals per standard 100	12 10 0	to 16 10 0
Deck Deals, per 40 for 15 cu.	0 19 0	to 1 5 0
Pine Staves, per mille	155 0 0	to 80 0 0
Lathwood, per fathom of 6 feet	9 19 0	to 13 0 0
Petersburg, Rig, and Archangel	15 0 0	to 17 19 0
Yr. Deals, per stand, hundred	11 0 0	to 12 0 0
White	11 0 0	to 12 0 0
Yellow Bottoms	13 10 0	to 16 10 0
Riga Logs, for 18 feet cubic	3 5 0	to 5 5 0
Stettin Staves, per mille of pine	150 0 0	to 175 0 0
Swedish Timber, per load	3 5 0	to 3 10 0
Gotbau Yr. Deals per hund. 12 ft. 3 in. 9 in.	18 10 0	to 21 10 0
White ditto	17 10 0	to 19 0 0
Yr. Bottoms per hd. 12 ft. 2 ½ in. 7 in.	11 10 0	to 14 0 0
Christiania Yr. Deals per hd. 12 ft. 3 in. 9 in.	20 0 0	to 23 0 0
White ditto	19 0 0	to 21 0 0
Quebec and St. John's Spruce Deals, per hundred, 12 ft. 3 in. 9 in.	17 0 0	to 19 0 0
1st quality spruce Deals, per st. hd.	16 0 0	to 19 0 0
Second do.	13 0 0	to 13 10 0
Third do.	11 10 0	to 12 0 0
Red Pine Deals per hd. 12 ft. 3 in. 9 in.	13 0 0	to 22 0 0
Red Pine Timber, per load	3 5 0	to 4 10 0
Yellow ditto	3 5 0	to 4 10 0
Birch ditto	2 10 0	to 4 10 0
elm ditto	3 10 0	to 4 10 0
Oak ditto	4 0 0	to 5 0 0
Standard Staves, per mille Standard	62 10 0	to 75 0 0
Pinecon Staves, per mille	16 0 0	to 18 10 0

MANURES.

LONDON, APRIL 25.

GUANO.—Peruvian No arrivals since last week's report; it remains in greater demand than the supply, and consequently our quotations are obtainable for immediate delivery.

LINSEED CAKES are dull.

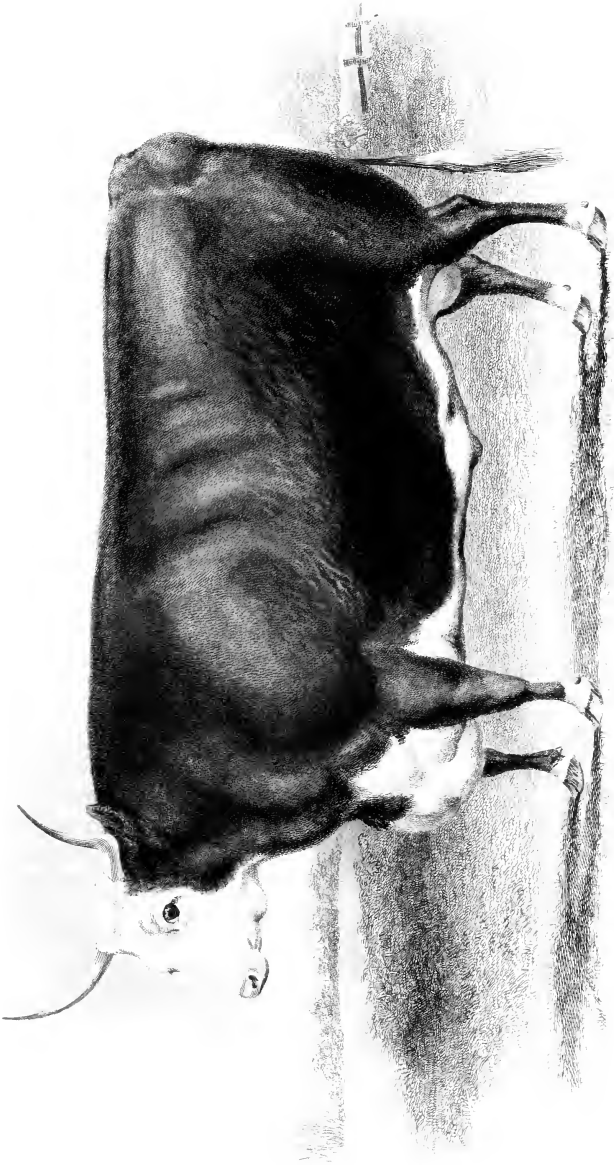
PRICES CURRENT OF GUANO.

Peruvian Guano, per ton	£11 0 0	to £12 0 0
In quantities under 5 tons	11 0 0	to 12 0 0
Do. 1st class (dunegrud)	9 0 0	to 10 0 0
Bolivian Guano	8 0 0	to 8 10 0

ARTIFICIAL MANURES, OIL CAKES, &c.

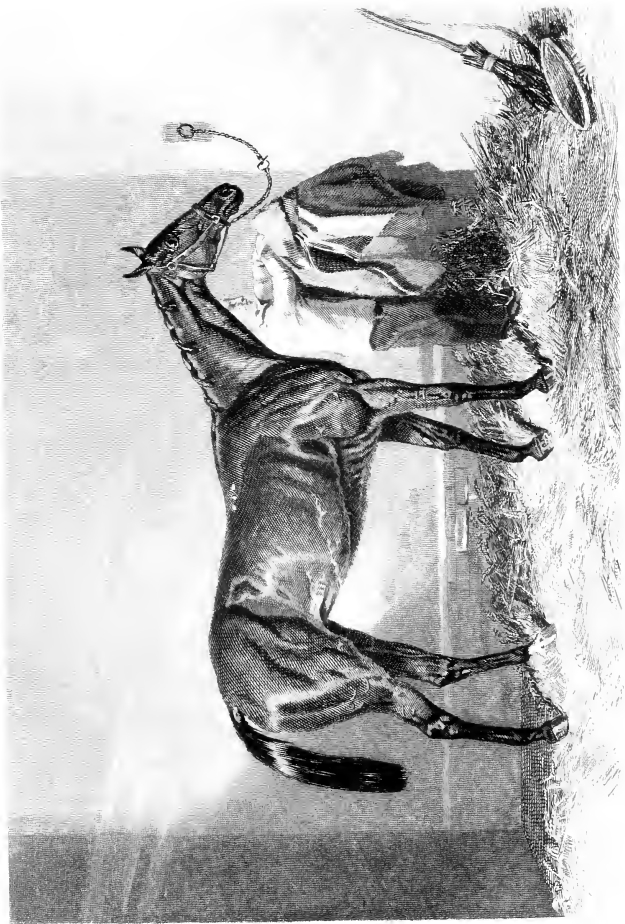
Pent Charcoal	2 15 0	to 0 0 0
Nitrate Soda	21 10 0	to 22 0 0
Nitrate Potash or Saltpetre	26 0 0	to 28 0 0
Salphate Ammoniac	15 0 0	to 16 0 0
Muriate ditto	22 6 0	to 23 0 0
Superphosphate of Lime	0 0 0	to 6 0 0
Soda, Ash or Alkali	0 0 0	to 8 0 0
Gypsum	1 10 0	to 1 15 0
Coprolite	3 0 0	to 3 10 0
Salphate of Copper, or Roman Vitriol for Wheat steeping	40 0 0	to 50 0 0
Salt	1 1 0	to 1 5 0
Bones ½ inch	0 0 0	to 0 15 0
Dust	0 0 0	to 0 17 0
Oil Vitriol, concentrated	0 1 0	to 0 0 0
Brown	0 0 0	to 0 0 0
Rope Cakes	5 5 0	to 5 10 0
London Cakes	0 0 0	to 9 10 0
Thin American in bbls. or bags	8 0 0	to 8 5 0
Thick ditto powder	8 0 0	to 8 5 0
Morselles	0 0 0	to 0 0 0
English	8 5 0	to 8 10 0











# THE FARMER'S MAGAZINE.

JUNE, 1853.

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## PLATE I.

### HEREFORD OX,

THE PROPERTY OF MR. JOHN MAYDWELL, OF ASHSTEAD, SURREY.

The subject of our first plate, is a Hereford ox, which obtained the first prize of £25, in class G, at the Smithfield Club Cattle Show, in December last. It was a remarkably fine animal, and purchased by Mr. Bannister of Threadneedle-street. The carcass weighed 184 stone 4 lbs., the fat amounting to 21 stone 6 lbs. (8lbs. to the stone).

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## PLATE II.

### SONGSTRESS,

BRED BY AND THE PROPERTY OF MR. JOHN SCOTT, OF MALTON, YORKSHIRE.

Songstress, a celebrated mare, was got by Irish Birdcatcher out of Cyprian by Partizan. She is a light yellow bay mare, with white ticks over her, standing fifteen hands three and a-half inches high; she has rather a plain head, as well as a straightish neck, but with good shoulders, and is very deep in her brisket and girth: she has immense ribs and barrel, good back, a little short and drooping from the hip to the tail, which is set on low; she has powerful arms, and fair-sized bone, with not over large thighs, not very good-looking hocks. Taken altogether, however, Songstress is a remarkably fine mare, as all are fain to admit who have seen her.

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## SUPERPHOSPHATE OF LIME: ITS PREPARATION FROM THE MINERAL PHOSPHATE OF LIME.

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

On a former occasion, I had an opportunity of tracing the first introduction of this salt as a manure, and such a detail can hardly fail to be encouraging to every friend of agriculture. The slow and cautious way in which bones were first employed, uncrushed and unfermented, afford instructive evidence how laboriously and slowly that farmer must conduct his experiments, who is

merely feeling his way in tedious trials, unaided by chemistry or a knowledge of what others have done in a similar direction.

The introduction of bones as a fertilizer well illustrates the truth of this conclusion. The first considerable employment of bones as a manure was about the year 1775, when General St. Leger spread, in a roughly broken state over some pas-

tures, those which had been long accumulating around his foxhound kennels. When General St. Leger made this trial, he no doubt acted on the persuasion that the *grease* of the bones formed their most valuable fertilizing portion; and this erroneous conviction long continued to be the general opinion of the English farmer.

More than a century, however, before General St. Leger's time, one English farmer had evidently the sagacity to suspect that there was something else in bones besides the oily portion which was useful as a manure.

Writing in the year 1669, John Worlidge, in his "Mystery of husbandry," remarked, (chap. v, sec 5,) "All marrow bones, fish bones, horn, or shavings of horn, or liquors wherein flesh or fish have lain, or any other thing whatsoever that hath any oily-ness or fatness in it, is useful in husbanding lands. It were not much labour to try whether the bones of horses or other beasts, whereof there are great quantities at some dog kennels, being burnt in heaps with some small addition of fuel, would be of good effect to be laid on lands." From this, the earliest suggestion of which I am aware, of the agricultural value of the more earthy portion of bones, to the time when I again suggested the same truth, an interval of more than a century and a half occurred. It was in the year 1834, in a little essay on the value of crushed bones, p. 6, that I remarked: "There is yet another source from whence the phosphate of lime might be obtained in large quantities for the use of the farmer, viz., the fossil bones or native phosphate of lime, which is found in various districts of this country in very considerable quantities, and would only require crushing or powdering to render it nearly as useful to the farmer as the recent bones; for, that the cartilage or oily matter of the bone does not constitute the chief fertilizing quality, is shown by the fact that the farmers who use bone dust will as readily employ that which has first been used, and all its fatty proportion extracted by the preparers of cart grease, as they will the unused fresh bones. The mineral substance, called the apatite, found in the Cornish tin mines, is nothing but phosphate of lime; 100 parts being composed of—

Phosphoric acid .. .. .	45
Lime .. .. .	55
	—100

The phosphate of lime is also found in many parts of the north of England, Hungary, and in immense beds in Spanish Estremadura, where it is said to be so common in many places, that the peasants make their walls and fences of it. 100 parts of this substance, called by mineralogists the phosphorite, contain—

Phosphoric acid and lime .. .. .	93
Carbonic acid .. .. .	1
Muriatic acid .. .. .	0.5
Fluoric acid .. .. .	2.5
Silica .. .. .	2
Oxide of iron .. .. .	1
	—100

Ten years more elapsed before any practical efforts were made to enquire into the truth of the facts thus suggested; when the inquiry as to the quantity in which this native phosphate of Spain exists having engaged the attention of the Royal Agricultural Society of England, Dr. Daubeny and Captain Widrington were induced, in 1843, to make a voyage into Spain to examine it. (*Jour. R.A.S.*, vol. v., p. 405). They found the phosphorite rock existing in large masses, a short distance from Logroson, a considerable village, about seven Spanish leagues to the south-east of Truxillo, in Estremadura. It forms "a rock varying from 7 to 16 feet in breadth, traceable for nearly two miles along the ground, and extending into the earth to a great, though as yet an unascertained, depth." Some specimens, analyzed by these usefully-employed voyagers, consisted, per cent., of—

Silica .. .. .	1.70
Peroxide of iron .. .. .	3.15
Fluoride of calcium (fluor spar)	14.0
Phosphate of lime .. .. .	81.15
	—100

They brought with them to England a sufficient supply of the phosphorite to enable its agricultural powers to be ascertained by various trials; some experiments on turnips were made by Dr. Daubeny with the following results (*Jour. R.A.S.*, vol. vi., p. 330):—

	Roots. lbs.	Tops. lbs.
Soil, simple, produced per acre	14,298	30,591
—manured with 10 cwt. of bone shavings, per acre ..	19,239	35,510
—Spanish phosphorite alone		
12 cwt. .. .. .	23,639	42,016
—Spanish phosphorite, 12 cwt., mixed with sulph. acid	30,869	34,476
—South American Guano, 260 lbs. .. .. .	31,114	47,060
—bones, with sulphuric acid, 11 cwt. .. .. .	31,898	17,600
—bones, finely powdered, 12 cwt. .. .. .	36,185	45,446
—stable dung, 22 tons ..	39,476	49,912

The conclusion to which these experiments tend is, as Dr. Daubeny well remarks, that "as the Spanish phosphorite, which appears to act so bene-

ficially, is wholly destitute of organic matter, it seems to follow that the more valuable portion at least of what is applied to the land, when bones are scattered over it, is the phosphate of lime, and not, as some have supposed, the oil or gelatine."

The conclusion to which we are thus led is supported by the experiments of Sir Harry Verney on the use of the phosphorite as a manure. The soil to which he applied it was a heavy sandy loam, resting on a clayey subsoil; the ground was sown with mangel wurzel in 1844, whose seeds, through the extreme drought of the summer, did not vegetate sufficiently for any satisfactory result to be obtained. In April, 1845, the ground was sown with Chevalier barley, with the following result (*Ibid.*, vol. vi., p. 333; Johnson's *Modern Agricultural Improvements*, p. 120):—

	Manure per acre.			Produce.		
	tons.	cwt.	qrs.	qrs.	bush.	pkts.
Soil, simple .. ..	0	0	0	3	6	2
Burnt bones .. ..	0	18	0	5	3	2
Unburnt bones .. .	1	7	0	5	0	0
Pigeon's dung .. .	0	18	0	7	5	0
Spanish phosphorite and sulphuric acid	0	18	0	6	3	2
Spanish phosphorite alone .. .. .	0	18	0	5	3	2
Superphosphate of lime .. .. .	1	5	3	5	6	3
Stable-yard dung ..	20	0	0	8	2	0

It was just before this period, that the use of superphosphate of lime, first suggested by Professor Liebig, began to attract the attention of the farmer. The first intimation of this discovery was published by this great German chemist in 1839; and in 1841, we find Mr. Fleming of Borrochan using it successfully; then came its use in 1842 by the members of the Morayshire Farmers' Club; and the same year Mr. E. Lawes and Sir James Murray took out their patents for the manufacture of the same salt. My readers must not, however, suppose that the use of the mineral phosphate of lime, in the manufacture of superphosphate of lime, was a concurrent circumstance with the introduction of the latter salt as a fertilizer. Two or three years elapsed before Professor Henslow first pointed out the existence of the pseudo-coprolites, which abound in phosphate of lime in the Suffolk Crag, and suggested their employment in the preparation of the superphosphate.

Other sources of supply have since been discovered, in America and in England; such as amidst the green sand and, chalk strata of Farnham, in Surrey, by Professor Way and Mr. Paine, and in the fossil remains of the chalk of the back of the Isle of Wight, by Mr. Nesbit. The following

was the result of some of Mr. Nesbit's examinations—

Substances analyzed	Ins l. matter.	Phos. ac d.	Phos. lime.	Amount equal to 100 tons of bones. Tons.
Cast of turrillite contained .....	5.00	24.26	49.79	90
Cast of ammonite	6.00	21.28	43.63	103
Small spongitic nodule .....	9.60	19.13	39.26	114
Small spongitic nodule .....	17.00	20.20	41.60	108
Cast of ammonite	10.00	23.06	47.32	95
Cast of ammonite	9.60	23.44	48.10	93
Cast of turrillite..	21.00	17.23	35.36	127
Green calcareous sand immediately encasing ditto ..	21.00	5.38	11.05	409
Small nodule ....	4.40	20.97	41.60	108
Green sand, or hassock, in which the fossils occur....	26.50	1.23	2.53	1778

The coprolites of the Suffolk crag contain an equally large proportion of phosphate of lime. A specimen analyzed for the London Manure Company contained—

Phosphate of lime.....	56
Phosphate of peroxide of iron	14
Carbonate of lime.....	21
Alumina.....	4
Silex.....	2
Carbonaceous matter.....	1
Moisture.....	2

The use of the mineral phosphate by the manufacturer is now very general; but as Professor Anderson remarks (*Trans. High. Soc.* 1853, p. 467), except by the more ignorant or unprincipled makers, is not exclusively employed; for all good manufacturers add a portion of recent bones.

The use of the superphosphate as a manure for root crops, although now very extensive, is certainly not so general as is desirable. On this subject the result of the practical labours of some of the Scotch Farmers' Clubs is very valuable. One of the most recent reports of these series of careful and laborious examinations is that of the Lockerbie Farmers' Club, whose district comprehends a large portion of the Vale of Annan. (*Trans. High. Soc.* 1853, p. 544.) "It seems to the Club," says this valuable detail, "to be more and more clearly ascertained, that to farmyard manure alone, in quantities however great, extra manures should always be added, as increasing the weight at a cost far under the extra cost. The members of the club are also more impressed with the opinion, that bones, either ground or dissolved, should in most cases, especially with swedes, be mixed with guano and lighter manures." The

report then gives the result of the various applications of manures to turnips, in the season of 1852-53. From these I select the amount of the dressings and the crop in tons, per imperial acre, on four farms.

Farm	Yards of farm manure	Cwts. of guano	Cwts. of dissolved bones	Crop of swedes
Broadchapel	—	3	2	22
Hillside	25	2	3 $\frac{2}{3}$	23
Shaw	25	2 $\frac{1}{2}$	1 $\frac{1}{2}$	28
Halleathe	18	1 $\frac{1}{2}$	1 $\frac{1}{2}$	27

We may safely conclude then, that the turnip soils of our island have hardly yet received their most remunerative applications of manure; and this conclusion, at a period when stock farms are becoming of increasing value, is well worthy of every farmer's attention. No fears need now be entertained of the supply of superphosphate of lime becoming less than the demand. A new field has

been laid under contribution; the chemist has extended his inquiries even below the surface of the earth; he has brought out the buried bones of long since extinct races of animals, to supply any deficiencies of the collectors of recent bones. He has, in fact, reversed the feeling expressed by George Canning, on a great political occasion of difficulty to his country, who said, when addressing the members of the Lower House of Parliament, "I thought of the *New World*, and I brought into existence the republics of South America." In such a spirit Professor Henslow was labouring, when he thought of the *Old World*, and of the fossil remains of the mammoth and the mastodon, and of the fishes which were their contemporaries. The chemist then drew forth their bones from the strata in which they lay concealed, and by his magic transformations made their constituents reappear in new forms of usefulness, and become the food and portion of animated beings.

## O A T F L O U R .

BY J. TOWERS, MEMBER R.A.S., H.S. OF LONDON, ETC.

Several weeks ago—just before that critical period when the probability of a successful seeding of wheat might depend upon the weather for a very limited time—a letter was received from Scotland, mentioning the introduction of a new farina, which gave promise of becoming exceedingly valuable for many culinary purposes, particularly among the labouring classes. Our correspondent is an agricultural authority of such eminence, that merely to name him would prove a recommendation. Another note, per date 15th April, was sent as an answer to some inquiries, from which the following extract is given, verbatim:—"The oat flour is really a good article, and for a pudding much superior to arrow-root, sago, and all such farinas. It has now been proved by chemistry that the oat is more nourishing to the human frame than the wheat; and this accounts for the strong brawny fellows to be found among the ploughmen of Scotland, whose chief articles of food are oatmeal and milk."

When I resided in Berkshire, an *attempt was made to obtain* fine oatmeal; but it failed because the millers were ignorant concerning the processes of kiln-drying, &c., employed in the north for the preparation of genuine oatmeal. One of them however, on the Thames, ground some oats as a *trial*, and separated the flour from the husk or bran. It was white and glutinous as that of wheat, of a pleasant flavour, but perfectly different

from that of Scotch meal. Still it was evident that, had the quantity been sufficient, and the sample better dressed, *fermented bread* might have been made from it.

While pondering upon a subject worthy of communication, my correspondent arrived here, and thus some particular information was obtained, which may be acceptable on several accounts. Being favoured by two packages of the Scotch flour, we have already proved its excellence. The sample has been found beautiful—pure in flour, and pasty when wetted. Fermented bread could doubtless be prepared by means of sweet yeast—or better, I think (till hot weather set in), by the good and fresh German or Dutch yeast, now frequently sold and used by pastrycooks and bakers. But the present price of the new flour is too high for bread, and so it will remain until the manufacture be greatly extended.

It is perhaps to be regretted that Mr. Smith should have patented his flour. The price has thereby been increased, and an obstacle to the preparation of bread-loaves created. At present it is sold in shilling packets, weighing with the wrappers 2lbs. 3oz. The label reads thus: "This new preparation of what has long constituted the characteristic food of Scotland, is calculated more than ever to develop the healthful and nutritious qualities of our favourite cereal, and to give increased value to its production. Chemistry has proved

that the farina of the oat supplies more nourishment of the muscle, bone, and blood of man, than any other known vegetable." The oat flour may be used as gruel, and also in the preparation of arrow-root, puddings of the lightest and finest quality, pancakes, manna, tapioca, &c.

The parcels were received here on Thursday, May 12, and on the following day a pudding, according to the given direction, was made with *two table-spoonfuls* of the flour. It was sufficient

for five persons—thus proving the fact of "a small quantity being requisite for the purpose."

I am given to understand that the oat is to a certain extent kiln-dried, then husked, and ground into flour. The process is yet in its infancy; but however worthy and excellent as a *placebit*, it will never attain a prominent position till produced in quantity sufficient (and at a *price*) to become fermented bread, as a substitute for wheat in loaves, at a time of deficiency or failure of crop.—May 13.

## WEEDS AND WEEDING.—SHORT SKETCHES OF THE WEEDS OF AGRICULTURE.

The month of May is the period when most weeds make their appearance amongst our corn crops, and at this time they demand the prompt and diligent attention of every cleanly farmer; for it is only by persevering effort—untiring and continuous—that such pests are to be eradicated.

Mr. Sinclair, in his essay on the "Weeds of Agriculture," extracted chiefly from Mr. Holditch's pamphlet (whose plan of classification he adopts), places them thus:

- 1st. Weeds which infest samples of corn;
- 2nd. Fallow weeds;
- 3rd. Rampant weeds; and
- 4th. Weeds which never rise into the sickle.

The first class which infest the sample are—1, Darnel; 2, Drank; 3, Cockle; 4, Tares; 5, Melilot; 6, Wild Oats; 7, Hariff; 8, Crow Needles; 9, Black Bindweed; 10, Snake-weed; 11, Charlock Seeds; 12, Horse Gold.

The second class, or fallow weeds, hard to be got rid of, are—1, Couch; 2, Rest-harrow; 3, Saw-wort (common way-thistle); 4, Curled Dock; 5, Tall, oat-like soft grass; 6, Colts'-foot; 7, Corn Bindweed; 8, Corn Mint; 9, Surface Twitch; 10, Black Grass; besides Wild Carrot, Hedge Parsley, Common Fools' Parsley, Spingel or Fennel, Common Knot Grass, and Great Round-headed Garlic.

The third class, those which principally encumber the soil, whose roots are annual, and whose seeds pass the sieve—1, Charlock; 2, Corn Poppy; 3, Bluebottle; 4, Mayweed; 5, Corn Marigold.

The fourth class, or weeds called Underlings, such as never rise in the crop nor come into the sickle—1, Groundsel; 2, Annual Meadow-Grass; 3, Chickweed; 4, Shepherd's Purse; 5, Spurry; 6, Camomile Feverfew; 7, Fat Hen; 8, Common Corn Salad; 9, Flixweed; 10, Common Furnitory; 11, Sand Mustard.

These, then, are the principal weeds which infest our arable lands. To describe them fully would far

exceed my bounds, but I will put them in tabular form, and add other common names, as I find them to be known by in various districts of the kingdom. I also add a few others.

Darnel—Drunken Darnel, Ray, Doit, Rye Brome-grass.

Drank—Drauk, Tall Brome-grass, Ray.

Cockle—Corn-Campion, Corn-Cockle.

Melilot—Common Melilot Clover.

Tares—Smooth Tare, Hairy-tine Tare, Wild Tares, Strangle Tare.

Wild Oats—Bearded Wild Oats, Haver.

Hariff—Goose-Tongue, Cleavers, Goose-Grass, Whip-Tongue.

Crow Needles—Shepherd's Needle, Venus's Comb, Needle Chervil, Beggars' Needle.

Black Bindweed—Climbing Buckwheat, Climbing Arsmart, Bearbind, Bindweed, Hopweed.

Snakeweed—Pale Persicaria, Arsmart, Willow-weed.

Charlock—Runch, Wild Mustard, Chadlock, Corn-Call.

Horse-Gold—Corn Butter-Cup, Frogwort.

Rest-Harrow—Cammock, Petty-Whin, Ground-Furze.

Couch—Twitch, Couch-Grass, Quoitch.

Saw-Wort—Common Thistle.

Curled Dock—Common Dock, Dock, Field-Sorrel.

Tall, oat-like, soft Grass—Knotted Twitch.

Colts'-Foot—Fools'-Foot.

Corn Bindweed—Small Bindweed.

Wild Carrot—Common Carrot, Dill.

Hedge Parsley—Dill, Hemlock, Kecks.

Common Fools' Parsley—Lesser Hemlock.

Spingel, or Fennel—Common Fennel.

Corn Mint—Horse Peppermint.

Surface Twitch—Small Creeping Bent, Red Robin, Spurious Fiorin.

Common Knot-Grass—Wire-Weed, Red Robin.

**Black Grass**—Black Bent, Spear Grass, Slender Foxtail Grass.

**Great Round-headed Garlic**—Ramson's Crow Garlic.

**Corn Poppy**—Red Poppy, Canker-Weed, Red Weed, Corn Rose, Cop Rose, Head-work, Red Mailkes.

**Bluebottle**—Knap-Weed, Corn Flower, Hurt-Siekle, Hard-Head, Horse Knot.

**May-weed**—Maker, Stinking Camomile.

**Corn Marigold**—In Scotland, Yellow Gowans, Quils, Gools; Kent, Yellow Bottle; Norfolk, Buddle; Midland Counties, Golds, Goulds, Gowls; North of England, Gow'ans, Goldens, Gules, Golden Ox-eye.

**Groundsel**. N.B. One plant is said to produce 2,080 seeds.

**Sow Thistle**. N.B. One plant is said to produce 11,040 seeds.

**Dandelion**. N.B. One plant is said to produce 2,700 seeds.

**Chickweed**—Common Stitche-wort.

**Shepherds' Purse**.

**Camomile Feverfew**—Wild Camomile.

**Fat Hen**—Goose-Foot, Lambs' Quarters, Wild Spinach, Mountain Spinach, Mails.

**Common Corn Salad**—Lambs' Lettuce.

**Flixweed**.

**Common Fumitory**.

**Sand Mustard**—Isle of Thanet Stink-Weed.

**Martail**—Toad Pipe, Puddock Pipe, Horse-Tail.

**Earth Nut**—Goose Grass.

Having enumerated most of the common weeds usually infesting our arable lands, I will in my next paper endeavour to give some account of the growth and habits of several of them; believing that a closer intimacy with their character will have its influence in deterring many cultivators from giving them quarter, even in the slightest degree. Carelessness on this point is very reprehensible, and very pernicious to good farming. My chief object is to point out the evil; I need not dwell for a moment to point out the innumerable courses to be pursued to effect their extirpation—the implements, tools, and appliances are so manifold. I may give a few hints in passing, but the energy and capital of the farmer only want applying, and that, as I have said above, untiringly and continuous. Not a weed must be allowed to cast its seed. Look at the sow thistle, for instance; or the groundsel or dandelion. Others, again, when plucked in the bud—as goldings, poppies, charlocks, doeks, &c.—will ripen their seeds as they lie on the ground. Colts'-foot, again, ripens its seeds so early that they are generally "blowing all over the farm" before the farmer is aware of their existence.

The farmer's life must necessarily be a busy and anxious one: his cares never cease—his judgment

is in constant requisition; from early dawn to the close of day his mind is engaged to promote the well-being of his stock (for every animal is an object of his care) or the prosperity of his crops, to which he has now to add much that is mercantile in its character. Verily the life of a farmer is not that state of bliss for which many a hard-worked trader sighs for.

In my last paper I enumerated and gave the common names of most of the weeds usually infesting arable lands; and in this I propose to describe very concisely the character and habits of some of the most pernicious of them, with a few hints in passing as to the best mode to be pursued for ensuring their destruction.

1st. *Colts'foot*.—This is the first weed seen after winter. It makes its appearance in very early spring; and we see its yellow *Dandelion*-looking flowers about our fallow and wheat lands long before any leaves show themselves. It soon ripens its seeds; and, as they possess a downy top, or cap, they are readily taken up by the wind, and freely distributed over the farm, with disastrous effects. The roots also increase very rapidly, particularly if the flower is allowed to remain, and the leaves to show themselves and expand: they shoot out horizontally and to a great extent, and also penetrate to a great depth, which renders this weed one of the most pernicious we have, and hardest to eradicate. HINTS:—It should never be allowed to ripen its seeds: these should be eaten off with sheep where practicable, and in other cases cut off by hoe or destroyed by early ploughing. The roots may, by deep ploughing, good forking, and perfect subsoil drainage, be got rid of. The deep ploughing should precede the fallowing. The fallowing should be continuous during the season, never allowing the soil to rest long enough for the root to appear on the surface. Ridge culture, with frequent horse-hoings, does much to retard its progress: late hand-hoeing in good corn crops is very beneficial. It delights in strong damp rich loam.

2nd. *Hariff*.—This is a very pernicious weed on all good loams, light loams, and light porous soils, but seldom found on strong clays. It is an annual, and is propagated by its seeds, which are very hardy. The plant is a long thin trailer, with tough wiry stems, and leaves branching out at intervals, eight in number, in a whorl, and shaped like a goose's tongue, from which it no doubt derives one of its many names: they are rough and fringed with prickles. It is a scrambling climbing weed, and seldom fails to make its way through the thickest masses of foliage. The seeds are round and very rough: they attach themselves very readily to flannel screens, by which means corn may be cleansed from them, which makes it almost unpardonable for a



farmer to sow them. **HINTS:** The seeds should be encouraged, by skeleton ploughing and harrowing, to vegetate in the autumn, before the winter ploughing, which will generally destroy them. Those left to grow in the spring are hard to get rid of: they grow at first very slowly: but as the plant gathers strength, it expands and climbs up rapidly on all sides, and unless active measures are resorted to, soon obtains serious hold and drags down the crop. Weeders either drag it up by hand or with long toothed rakes, and it sometimes in heavy crops becomes necessary to resort to the horse-rake to "comb" the crop. It is easily mastered by constant care and effort.

3rd. *Corn Bind-weed*.—This is a weed very similar in its injurious effects to hariff: it climbs up the stems of corn, and drags down the crop; it grows freely upon the same soils. It penetrates to a great depth, and is very difficult to eradicate. The stems and tendrils are very wiry and strong, run to a great length, and attach themselves tenaciously to everything within reach. The roots are numerous, hardy, and penetrate to a very great depth, so as to render it almost impossible to kill them. The seed is triangular, of a brown colour, smooth, and retains its vitality a very long time. **HINTS:** Deep ploughing, immediate and continuous fallowing (as in coltsfoot), is the surest way of extirpation: even if it is extended to two seasons, it must be got rid of.

4th. *Common Dock*.—This is a very hardy and injurious weed, and its productive powers are so great as to render it the worst weed we have infesting our clover crops; and its seeds are so nearly the size of red clover seeds, as to render them incapable of separation: they are, however, easily distinguishable, being of triangular shape and bright brown colour. The roots are perennial and most tenacious of life, for if pulled up and left on moist soil, they soon attach themselves to it again, and grow prosperously. **HINTS:** Encourage the growth of seeds (see hariff). For cradicating roots, see coltsfoot, &c. It is unpardonable neglect on the part of clover-seed growers to allow docks to produce their seeds with the clover: they ought by all means to be taken out.

5th. *Corn Marigold—Goldings*.—This is such a pernicious weed, that the Danes have a law to oblige farmers to extirpate it; and rewards are often offered in Prussia for every corn marigold that is plucked up and destroyed. It is well known in almost every part of the kingdom, and is found amongst all crops. Though a mere annual, it is destroyed with much difficulty. It multiplies very rapidly, and soon overspreads the farm, and frequently grows so thick and strong as to prevent the progress of the corn crop. The seeds, or grains, are very hardy, rather large, flat, rough, and angular; they germinate late, and grow slowly; but when the weather is

warm they gather strength so fast, and branch away with such rapidity and vigour, as to defy all resistance, and unless weeding is speedily resorted to, they will "absorb all the nutritive matter contained in the atmosphere as well as in the soil;" and when pulled, their vitality is so great, that they will frequently continue to grow, and will ripen their seeds if thrown together in a heap. The seeds will pass through the bodies of animals uninjured, and it is thus propagated by the dung. The plant itself will attain the height of four feet on good soils. It produces a large yellow daisy-looking flower, yielding many of them, and great abundance of seeds. **HINTS:** Encourage the growth of the seeds in the autumn by skeleton ploughing and harrowing, afterwards plough. In the spring, resort to constant hand-pulling, never allowing a seed to ripen. When the land is overrun, fallowing (as above) must take place, and then they will seldom be destroyed in one season, even if most assiduously followed up. Every farmer ought most carefully to avoid sowing them with his seed corn. It is such a pest that every caution should be taken to prevent its introduction into new districts.

6th. *Charlock—Wild Mustard*.—This is a highly injurious weed, and is one generally known: it flourishes surprisingly on good soils, and woefully infests most moderate ill-farmed soils. It is an annual, and there are four varieties of it, though the Wild Mustard is that most commonly known. The seeds are very tenacious of life: if not exposed to atmospheric influence, they will remain in all their vitality for many years buried in the soil: if, unfortunately, they are allowed to ripen in a crop, they may be collected and sold to oil crushers as rape. **HINTS:** This plant may be readily extirpated: nothing so effectual as constant pulling before it ripens its seeds, and it is seldom any other plan answers. Fallowing, &c., &c., as above, is necessary; but these small round seeds roll into worm-holes and crevices everywhere, so that fallowing will not destroy them.

7th. *Corn Poppy*.—On all dry, sandy, or gravelly soils, and upon light neglected loams, this is a very obnoxious weed. Its bright scarlet flower, in the spring, is seen at a great distance; and it grows very rapidly, requiring the quickest attention to prevent its injurious effect upon the crop. The seeds are small, and like the charlock, possess a great vitality; they will lie for ages in the land uninjured. There is a peculiarity in the growth of these weeds: if the corn crop on soils subject to these pests is got in on a loose, friable, open soil, and it so continues porous, poppies and charlocks are certain to appear; but if they are, by the season or the culture, rendered close and compact, they will seldom be seen; hence "a poppy year," or "a charlock year."

HINTS: Great pains should be taken in the weeding, and great care that no seeds go along with the manure. This weed is more neglected by farmers than most others, which is decidedly wrong, as none propagate more freely. To effect its destruction see as above, coltsfoot, hariff, &c., &c. P. F.

## CHEMICAL AND MECHANICAL SCIENCE—ITS PROGRESS AND IMPORTANCE TO AGRICULTURE.

Of late years a very prominent section of the public mind, so to speak, has opposed itself to the theory of patents, treating with contempt the idea of invention as a distinct subdivision of labour and property, by which the inventor is to gain a livelihood. Invention is even looked upon by not a few of this class as an unfortunate sort of craziness—a diseased state of mind, as it were, from which all sober, sensible, and industrious people may safely say—"Good Lord, deliver us." And be it observed, that grave conclusions of this kind are not the offspring of hasty opinion, but are based upon no less broad a foundation than the inventor's own misfortunes. "The majority of inventors lose money by their patents, while not a few ruin themselves." Hence the conclusion.

There is no department of the body-politic in which this opposition to patents runs higher than in agriculture, for our aristocracy are strongly tainted with it, while our farmers are scarcely anything behind them. Indeed, so strongly does the notion prevail, that one is tempted to ask—What have patents to do with agriculture? Would not landlords and tenants be better without them? Would not rents be higher and better paid, and the profits of the farmer at the same time somewhat larger? Would not the crazy inventor himself be then highly respected and patronized, while misfortune's brood would be far from his door?

The days were when such questions might have been fairly entertained; but those days are now gone, and no more in keeping with the spirit of the age and the progress of science, than would the feudal notions of our Norman forefathers, were they to rise up and join issue with the present state of things. The different members of society must now learn to bear each his own burden upon his own shoulders, and each reap the fruit of his own talents and industry. A mendicant dependence upon the generosity of another is no longer a safe horse to ride the world with. One must have an honest calling of his own—eating his own bread in the sweat of his own brow; and such is the state of competition in the labour market, that subdivisions of employments or manipulations in every art must be organized with the greatest care. "The Jack-of-all-trades is" truly now "a master in none." In short, each must professionally cultivate his own peculiar talent in the highest degree.

How then, it may be asked, do we account for the inventor's misfortunes—the grave facts from which the above conclusions are deduced? If inventors must live by their profession, they have certainly yet much to learn in the way of cultivating their talents before success crown their labours!

A man's misfortunes seldom or ever militate against

the existence of his profession. His professional duties may be good and honourable—yea, absolutely necessary—yet his misfortunes many, but easily accounted for; as in the case of the inventor and many others. For example:—

Very few landlords make fortunes of their patents or estates any more than inventors. Indeed, it may safely be said, without giving offence, that many of them are in debt. Are we therefore to conclude that the profession of the landlord is a delusion! that his patent is a national calamity! that it should be tossed to the winds? and that he himself should rely upon the generosity of his tenants—taking what rents they are annually pleased to give?

The proposition would certainly be calculated to silence a vast amount of grumbling now experienced among farmers about bad times. There might, no doubt, be exceptions, who would grumble on still; but this would be the general rule; at the same time, we need hardly waste words on the question of those landlords who have so undignifiedly given their countenance, and even support to its parallel, to try the experiment of its reduction to practice. "*Do as you would be done by,*" however, is a golden maxim.

It is much to be regretted that inventors cannot receive a fair recompense for their labours, considering their importance to the public, and the check which the opposite gives to the progress of science. The reason of this unfortunate state of things is of a four-fold character. 1st.—Ignorance of the nature and real value of inventions. 2nd.—Adverse interests involved. 3rd.—Consequent expense of their reduction to practice, including patents, and, 4th.—Lukewarmness of the public towards the interest of its members, with a natural tendency and proneness to tread in the footsteps of by-gone times.

1st.—Invention is progress in chemistry or mechanics. Every new discovery in agriculture, or the management of live stock, or daily produce, is an invention—the subject of a patent. Not a single step can be made in advance without its aid. Old-fashioned folks may jog on, in the footsteps of their forefathers; doing as they did, though not feeling as they felt; because of the altered circumstances in which they have to strive (for life ever has been, and ever will be, a struggle), and the difference in the relation between them and the other members of society and the world, and therefore complaining as they journey on, while echo reverberates from the four quarters of heaven—*bad times*. So distressing have circumstances been of late, that commiseration with the sufferers was publicly made from the Throne.

Now, the real cause of all the embarrassments and misery experienced on this occasion, and not yet got over, is the want of invention—progress in the chemical and mechanical sciences, that source to which the eye of every intelligent landlord and tenant is now turned for succour. Hence, there is no profession which ought to be cultivated with greater zeal by British agriculture at present than invention, and no labours fostered with greater care than those of the genius whose inventions bear upon the general resources of the British soil.

Such being the nature and value of invention, it unfortunately cannot be denied that too much ignorance has hitherto prevailed as to its proper cultivation in connection with agriculture. Witness, for instance, the case of the reaping machine, invented and reduced to a state of perfection, comparatively speaking, half a century ago by poor Ogle, a national schoolmaster at Alnwick, who died, we believe, in penury! While those who joined him in his praiseworthy efforts were obliged to emigrate to America, carrying with them a model of the Alnwick reaper, to seek the patronage of a more intelligent agricultural body. Of the reception which the invention met with in the New World, the Great Exhibition of 1851 told us with a practical plainness which carried conviction to the heart of every farmer in the kingdom, and which, so long as time remains, will stand a stigma upon the agricultural character of the last half century. Numerous other examples might be quoted, where the English farmer has turned his back upon the services of the inventor; but suffice it to say that, generally speaking, he has fallen a long way behind the other arts in the march of chemical and mechanical improvement; and although there is now a little humming or buzzing in the hive, it will take active wings before they overtake those a-head of them—for once behind in the harvest field, it is no easy matter getting up again.

2nd.—Adverse interests are of various kinds. For example, inventors not unfrequently think more of their inventions than they are worth; so that their charges, or patent revenues, interfere with the profits of the implement maker, manure manufacturer, and the farmer. A new tool always requires a little time before the workman gets fully master of it; and sometimes when it falls into the hands of a whimsical and awkward fellow, it gets a bad name, undeservedly. Newly invented things have a tendency to reduce the value of the old-fashioned; and in agriculture, after they do take the market, the old fetch almost nothing; so that farmers, partly from an unwillingness to throw aside half-worn things, and partly from a want of capital, seldom purchase the newly-patented. Half the period of the patent is often allowed to pass over, and probably three quarters, before it is embraced, and even those who do so at this period are few and far between; for in not a few provinces there is a sort of public odium attached to the followers of novelty, which is evaded with a degree of superstitious fear not very easily described, much less satisfactorily accounted for. Again, there is always a great amount of competition among rival patents. Two ploughs, for instance, are so nearly upon a par—this being the best on this kind of soil, and that on that;

while soils are so diversified, that practice has its own difficulties in making the best selection; and to add to the embarrassments of the farmer on these occasions, such is the genius of invention, that there is always something better than either of the two rivals about to make its appearance. Vendors have always a stock of old things on hand to dispose of, at tempting little money; and this is another of those adverse things which inventions have to experience. Next comes the uncertainty of tenure. Half the farmers of England are uncertain of their tenancies to-morrow, so that it would be useless for them to embrace patents to-day which are only calculated to raise the rent of to-morrow. Hence the general conclusion.

Such are a few of the many adversities which patents have to encounter on their introduction to the world. It would be an endless task to enumerate the whole, much more to furnish working details for illustration.

3rd.—Besides the increase of expense which opposition of the above kind gives rise to, the expenses at the Patent Office and courts at Westminster, together with the reduction of the invention at first to practice, have hitherto exceeded the average value of patents. All the Blue Book evidence given before Parliament proves this. For example, for the sake of argument and illustration, the whole of the expenses connected with the Patent Office, law courts, and simple reduction of the invention to practice incurred by the inventor before the sealing of his patent may be set down at £500—a sum which rather falls short than exceeds the average. Of this sum, about £400 was devoured by the Patent Office alone! Now all the evidence before Parliament went to show that the majority of inventors, after having paid away this sum, were never able to get it in again. They could never bring up the debtor side of their ledger account to show a balance in favour of their patents—the balance being always on the wrong side. Some of the patents, it is true, turned out failures; but the great majority uniformly returned something, although not enough to defray the above expenses. Hence the obvious conclusion at which we have arrived.

The Patent Office appears to think that the impression of its seal enhances the value of the thing patented, but this is a serious mistake; for the patented thing just requires so much more steam to drive it by the expense of the patent, so to speak. Indeed, such is the peculiar notions of many landlords and farmers, and their aversion to everything in the shape of monopoly, that they will actually embrace more cheerfully and sooner the non-patented thing than the patented—the things themselves being otherwise equal in merit.

The expense at the New Patent Office is about half that at the old, or £200—with this difference, that a patent is obtainable for from £10 to £50, including specifications and patent agents' fees, the balance being payable at two subsequent periods of the fourteen years: a feature in the late statute which connects it with the pillory—the graduated scale of payments being nothing less in practice than a screw in the hands of the Patent Office for forcing from the pockets of inventors a larger revenue more successfully than it otherwise could

have done; for if an invention is only worth £200—a sum certainly the average value of inventions in connection with agriculture—then the patentee may receive during the first term £40, during the second £60, and during the last £100. Such being the state of his accounts, it may be fairly asked where is his own profit for the benefits he has conferred on agriculture? or, what the benefits of the graduated scale to him? An invention worth to farmers several thousands annually, when fully embraced, would not realize for the inventor much above £200; and before it even fetched this sum it must be attended with some popularity, as well as patronage, from the great. Hence the position of the inventor.

The enormous charges and stamp duties at the Patent Office form a heavy tax upon the progress of chemical and mechanical science in connection with the arts, especially agriculture—a tax the most unprincipled of all the taxes in the Chancellor's Budget, and which, therefore, ought to be repealed or reduced to 1s. for stamp duty, as is now proposed, for leases, with some £5 as the items of office expenses. If farmers in America, where labour is generally more expensive than in this country, can obtain a patent for £5, why should the English farmer pay £200? Why place a millstone of this kind upon his neck, and then demand of him to keep pace with his transatlantic neighbours in the march of chemical and mechanical improvement? Farmers are everywhere turning their attention to progress in those sciences, as has already been said; and nothing can be more unjust than to fleece them thus in the Patent Office, whenever they make a discovery. The days were when the inventions of the villein were the property of his chief, like the wool on his sheep's back; but those days are happily gone, for the farmer is now free, and his inventions are his own property: but with the change which has taken place new duties devolve upon him. His relation is not only different with society and the world in general, but with his own family. He has not only to make provision for the latter, but the former look up to him as the principal party on whom the improvement and proper cultivation of the soil depend. They accuse him, and that justly too, of having fallen behind in the march of chemical and mechanical improvements. But is he, after all, honestly to blame? Has he received the necessary encouragement to advance? Is it the duty of the English farmer to toil all day in the field for the landlord, and spend his early mornings and evenings late in upholding an exorbitant Patent Office? In short, are we not justified in laying the backward state of those sciences in connection with agriculture at the door of the Patent Office? The facts stated in a previous paragraph obviously answer in the affirmative.

4th.—The last of the causes adduced, which prevents the fair remuneration of the inventor, and the consequent greatest possible progress of science, is a lukewarm state of the public mind, with a proneness to plod in the footsteps of antiquated times. It has already been admitted that not a few of the landed interest not only extend a cold indifference towards inventions, but an aversion to

the theory of patents altogether; and their clinging to antiquated practice is a proposition too often enunciated to require comment. Apart from the plea of expenses already noticed, there is no zeal manifested among farmers, generally speaking; to encourage useful inventions by rewarding the labours of the inventor. Clubs are formed for every other purpose but the carrying out of agricultural patents in a manner the most conducive to themselves and their owners. A farmer's son has got a good education, has made some proficiency in chemistry and mechanics, has made an important discovery worth some £100,000 annually to his country—it is the only property he has. His father is in what is termed apparently fair circumstances, but pays a long rent, and the only fortune he has been able to give to his family is a good education. His son very naturally proposes taking out a patent, but the transaction is looked upon as ignoble by the craft, especially the higher branches of it; it is more honourable, according to their peculiar notions, to give away this property and rely upon the generosity of the receivers! His school-fellow, young Mr. So-and-so, has taken out a patent; but there is no joint co-operation among farmers to carry it out to their own benefit and the benefit of the inventor. "He has got a patent," say they, "and that will take care of him." So he is left to ponder over the impression of the great seal and its value in agriculture, minus £200 for his patent, £100 for experiments, and as much for advertisements, all to no purpose. My lord is out with his hounds, his tenants follow after; and there is no one left to think of progress in chemistry and mechanics. The young farmer and his patent is ever the jest of the field. Entail laws however stringent, leases however long, with game laws, and a long list of protectives, are all lauded to the skies. But for a discovery in agricultural science there is no protection whatever—none! To break up an entailed estate, and divide the proceeds of sale among farmers, and then rely upon their generosity, would be tenfold worse than prodigality unpardonable; but for the young farmer to give away his estate, and depend upon the generosity of landlords, is a transaction—oh, how noble! Such, generous reader, is that blind selfishness which the march of improvement has lately brought to light in the agricultural world. To find out the seat of the disease, it is said, is to effect half a cure; and now that this discovery has been made, the issue is more than flattering.

The propriety—nay, the necessity—of progress in science will appear the more obvious if we take a cursory glance at the chemical and mechanical position and prospects of British and American agriculture in the commercial world; for these will show that it is not enough merely to carry out the most improved practice now known, because that is only bringing up the rear to the van while the van itself is in danger. Ingenuity must give birth to new theories, and those must be reduced to practice, before the resources of British agriculture can be successfully developed. Our observations—although confined, for the sake of brevity, to America—will yet be found applicable to our colonies of the southern hemisphere, and not a few European states.

Chemistry on the one hand has satisfactorily shown that the British soil, from time immemorial, has been labouring under that most serious of all complaints—CONSUMPTION; and what renders the discovery the more interesting is the fact that it was made about the same time by our transatlantic neighbours, and that doctors in both countries have arrived at identically the same conclusion, each prescribing an abundance of cheap guano as the cure. Both have discovered that there is a larger amount of animal, vegetable, and mineral substances annually removed from the soil by cropping than is restored again by manuring, and that eventually it must sink under such a system; hence the reason why both have prescribed that the balance be restored in the shape of artificial manures. In both countries, however, the price of artificial manures is so high, in comparison with that of produce, as to prevent the successful application of the balance. An advance has lately taken place in the price of produce, it is true; but such can never counterbalance a deficiency of weight. Nothing can be more hopeless than to rely upon the efficacy of such a theory; for under it the deficiency of weight would annually be growing greater and greater, other things being the same, so that the price would have to increase proportionally. Hence the ultimate conclusion such a theory would involve us in—viz., the lowest possible amount of produce with the corresponding highest price: a bushel of wheat, for instance, for a bushel of gold, than which scarcely anything can be more absurd. Even granting that the English farmer should rely upon such a system, the American farmer will not—a fact which will compel the former to think more favourably of chemistry, as will subsequently be shown.

But although there is a considerable degree of chemical identity between English and American agriculture, yet there is a very great diversity of circumstances connected therewith not unworthy of notice. Hitherto the practice of the latter has been that of the old "out-field and in-field" system of the former. The virgin soil, for instance, when first broken up from the prairie or forest, was cropped year after year successively, so long as the produce defrayed the expense of culture; when this failed it was thrown down in grass, in which state it was allowed to lie for a few years, when it was again subjected to the plough. Under this antiquated system experience has ultimately shown that the amount of produce at each succeeding upbreak has been growing less and less, although scarcely perceptible at first. It was long thought by the farmers of the old States that their fertile valleys, such as the Mohawk and Hudson, were inexhaustible; but the statistical facts of the American Patent Office have exploded such a theory, for lands which at first yielded upwards of 30 and 40 bushels per acre barely now yield 10 bushels, while 300 lbs. of guano applied restores fertility, a result which has brought them to the conviction "that something can be learned from books as well as from practice." Hence the change which is fast taking place not only in the States, but in Canada also, where the same practice is followed. Farmers are everywhere adopting the alternate system of husbandry, feeding of stock, and economy

of manures. Not only are they making themselves acquainted with the agricultural literature of this country, but are also examining its practice and importing its best breeds of cattle; while the Commissioners of Patents at Washington have applied to Congress for the means, and are holding out very flattering prospects to inventors for the discovery of artificial manures. The sewage matter of Washington, and the other American towns, is no longer to be allowed to run to waste—rocks of phosphate of lime to remain below the surface of the soil. In short, the Americans are straining every nerve to bring the manual resources of their boundless empire to bear upon its exhausted and long-neglected arable lands; and of the issue being successful, there cannot be a doubt in the mind of any one acquainted with the genius and persevering industry of the people.

It need hardly be said that the position of the English farmer during the past half century has been very different from the above; for, however imperfect may have been his practice, and susceptible of improvement, it cannot be questioned that during this period he has been a long way a-head of his transatlantic neighbour as to chemical science in connection with agriculture. He has, for instance, reaped the benefits of the alternate system of manuring and cropping. He has had the most improved breeds of cattle and sheep in the world for working up the non-marketable produce of the soil into butcher-meat and dairy produce, and also the best markets; while the theory and practice of artificial manuring have been zealously advocated by him from the days of Sir Humphrey Davy downwards—advantages of no ordinary value. Prospectively, however, parties are entering upon a new chemical career apparently as yet somewhat different, for her Majesty's Commissioners of Patents are treating the English farmer less liberally than his opponent is treated. With them agricultural chemistry has not yet become a practical question of progress and tenant-right. A feudal spirit unfortunately still characterises the patent laws of England.

In the mechanical world the past and present position of English and American agriculture is equally, if not more, diversified than in the chemical; while future prospects are greatly more against the former, owing to the influence of emigration on the labour market. Hitherto the American farmer has not only sustained a heavy loss for the want of proper roads, railroads, inland navigation, drainage, irrigation works, and various other mechanical agents, together with the non-economy of manure already noticed, but he has also been paying at the same time double the price for labour. At the present moment the difference in this latter respect alone cannot be estimated at less than £50,000,000 annually against him, in favour of the English farmer. No doubt the latter has a greater load of taxes to bear; so that, at the present, parties, after all, may stand upon a comparative level; but the prospects before them are very different, for the English farmer is obviously entering the race-ground with his rival, wearing this millstone about his neck, while wages are rising, and must inevitably continue to do so until they attain the American level, for independently of the late discoveries of gold in the

northern and southern hemispheres, which have proved so attractive, our colonies, including the United States, have now attained to such a degree of civilization from the growth of society, and the progress of the arts and sciences, that emigration has within the last few years become a new theory in the minds of our labouring population. The many associations which formerly bound the rustic heart to the land of its nativity are fast disappearing with the superstitious notions of bygone times. Intellect is expanding with the progress of education, taking a more comprehensive view of the various fields of the world as the handiwork of one omniscient and omnipresent Creator, so that the tide of emigration must continue to flow from the shores of the mother country with unabated efflux. It is obviously a work of providence, and who can stay it? Hence the conclusion. In many provinces a considerable increase of wages has already taken place, but fortunately it has been counterbalanced by a corresponding reduction of poor-rates; but for farther increase—an increase which may soon exceed the whole rental of the soil—there is no counteracting provision of this kind to be expected. The only source to which the British farmer can look for relief is a greater abridgment of labour by machinery. Hitherto farmers have had to contend with poor-rates and an idle pauper population, whose interest, or rather influence, was diametrically opposite to such an abridgment of labour. The rustics of Alnwick, for instance, threatened to burn Ogle and his invaluable reaper if he persevered in its reduction to practice; and how many incendiary fires have blazed in the provinces for similar reasons we need not enumerate. All these things have been against the English farmer making progress in mechanical science. But those days are now happily gone, leaving him free to act, but imperatively calling upon him at the same time to tax his ingenuity so as to abridge labour by every available means, *performing at the same time a greater amount of it*. For this purpose manual and horse-power must both be succeeded by steam; the iron sinews of Birmingham must be brought to bear upon the cultivation of the soil—the husbandry of its produce and manufacture for market. But while he is thus called upon to progress in mechanical science, it is obviously the duty of government to remove every obstacle out of his way, and to allow him fair remuneration for the benefits his ingenuity confers upon his country.

Such are the position and prospects of the agriculture of the two greatest and most intelligent states in the world—the one importing and the other exporting agricultural produce—a commercial relation which must ever give rise to a spirit of emulation among their farmers, in chemical and mechanical science, so long as it exists between them, ruinous to those who fall behind in the march of improvement. As yet the English farmer has many advantages over his opponent, but these are fast disappearing; while he is subject, directly and indirectly, to many oppressive and antiquated burdens and customs, from which it is no easy matter disentangling himself and establishing his tenant-right on a solid foundation with his landlord and the public, who have hitherto reaped the lion's share of the benefits arising

from his ingenuity, either as to the permanent improvement of the soil, or economy of labour by implements and machinery of an improved kind for its ordinary cultivation and management; for produce has been continually falling in price, while rents have been rising—facts which speak for themselves. On the other hand, retrospectively viewed, the American farmer has got over the barbarous stage of colonial enterprise, so to speak; while, prospectively, a brighter view opens up before him. His land has been exhausted, it is true; but it is grateful for manure, 3 cwt. of guano increasing its produce from 10 to 30 bushels per acre. Railroads and steam navigation, again, have brought his boundless fields to the threshold of Mark Lane. Labour is high, but rather decreasing than increasing, compensation for mechanical ingenuity being enjoyed by patents on easy terms. "The inventive genius of mechanics," says Mr. Rottiers, in the Report of the Commissioners of Patents on Agriculture at Washington, for 1849, "by improving the various implements of husbandry, has done much for the tillers of the soil. Their newly-invented horse-powers, their thrashers and separators, their seed-sowers and grain-crushers, and other valuable machines, do much to expedite the labours of the farm; and the time is fast approaching when the husbandman will have more leisure for mental cultivation, so that the science of farming will be much better understood than it now is. The products of the land, instead of being lessened, under an improved system of tillage will constantly be increased; and the tiller of the soil, fully satisfied with his vocation, will bless Providence that made him a farmer."

At the present moment, therefore, the prospects of English and American agriculture are very different; and the difference is obviously such as to demand, not only the prompt attention of English landlords and tenants, but the timely consideration of the legislature also, for if a difficulty was experienced in competing with the American farmer under protection prices and cheap labour, coupled with the many disadvantages under which he laboured, what must he feel under free-trade prices, when those disadvantages are removed, and when labour is advancing in the home market? The answer is obvious.

A revision of stamp duties is now being made, which affords Government an opportunity of making that alteration in the patent laws formerly suggested, so as to bring the expense of a patent to the American level—an alteration which would secure to the English farmer that tenant-right to compensation for the chemical and mechanical improvements which his inventions confer upon his country, as now enjoyed by the American farmer, and also foster with equal care the progress of those sciences generally. The present is certainly not the time for English agriculture to fall behind, and least of all for her landlords to neglect the opportunity now afforded them of making that provision for an advance of wages which the progress of science demands; for unless that progress is made, rents must inevitably fall to the American level. In Canada-west lands, cleared and yielding 25 to 30 bushels of wheat per acre, can be

rented for 6s. 6d., or a dollar and a-half. Are English landlords prepared for such a change? Neither is it the time for farmers to be silent, for they are now generally agreed as to the principle of tenant-right, and principle is all that we are advocating at present. Now a tenant-right is neither more nor less than a patent for chemical and mechanical improvements, at the expiry of a definite term—it is a private patent between a landlord and tenant; whereas her Majesty's letters patent is a public tenant-right—a patent for chemical and mechanical improvements conferred upon the public—so that every advocate of tenant-right is bound in principle to support the question at issue.

In order the better to be understood, on a question where principle is involved, let us illustrate it by the following example—viz. :

"A tenant's private patent is worth £1,000, at the expiry of his lease. On the execution of his lease, or entry to his farm, in the absence of a written lease, he would have to pay, according to the late patent laws, £400, and by the present about half that sum, by way of stamp duty; so that he only pockets £800 for his patent, minus the interest on the advance, for his landlord will not give him £1,200 for his improvements, because he has paid £200 at the Stamp Office. But if, on the other hand, his chemical and mechanical improvements are only worth £200, then the Stamp Office takes the whole; so that he loses the interest on the advance for the improvement of his landlord's estate. Hence the obvious conclusion that the tenant ought to pay a nominal tax only to the Stamp Office—a conclusion at which the American Congress has long ago arrived relative to public patents, and the English Legislature relative to private ones; and we do not see why it should not extend the principle to public patents also, for the practice (principle it cannot be called) of taxing a man for conferring a public benefit on his country is out of date.

Two or three objections to our proposition require briefly to be answered.

1. "Public patents," it is said, "ought to be self-supporting, and, therefore, pay the whole of the expenses at the Patent Office."

The soundness of the theory is admitted. The fallacy of the practice lies in the Patent Office saddling the wrong horse; for a public patent is a public patent, representing an invention now the property of the public, upon which it confers the benefit—the patentee only getting a small per-centage of it—and for whose interest the patent was issued, and not the private interest of the patentee. Hence, it is the public which ought to pay the expenses of the Patent Office, not the inventor; and the public is well able to do so, for all useful patents increase the resources of the country, and hence its revenue. The present revenue of the country amounts to about one-fourth the value of its agricultural produce; and if farmers can abridge labour, and increase the produce equivalent to £50,000,000 annually, which is possible by chemical and mechanical means, and which the progress of science in America may soon call upon them to do, it is very evident that

the revenue at the same time must directly and indirectly be increased several millions also.

2. "Patents should be taxed by way of legacy duty."

This is fallacious; for it supposes an invention a succession, whereas it is a *creation*. Now, a landlord is not taxed when he increases the value of his property by draining or building houses, &c. Those who advance this objection overlook the fact that the property of the public patentee is very *unjustly twice taxed*.

3. "Cheap patents would give rise to a multiplicity of them, many of which would be useless, and consequently stand in the way of future progress in chemical and mechanical science."

These are not the times for farmers objecting to cheap patents on the Cr. side of their accounts, much less to a multiplicity of good things resulting from them on the opposite side of the ledger. The fallacy of the proposition is in the expression *useless*, there being no such thing in existence; for the admission of an unsuccessful invention standing in the way of a subsequent inventor taking out a patent proves it to be useful, more so probably than its owner contemplated; and hence he has a right to its value. Statute is here at fault for not making provision that such cases be settled by arbitration or jury, as proposed by the Society of Arts. Many examples of this kind now exist, so that expenses are no safeguard whatever against unsuccessful patents standing in the way of future progress.

Many other objections might be stated, and as easily refuted, did our limits admit. Instead of our proposition suffering from objections like the above, it comes out of such a fire, like the gold of the refiner, more and more pure the oftener it is tried.

In these observations on the progress and importance of chemical and mechanical science to agriculture, we have been drawn further into a patent law view of the subject than at first was contemplated. The tenant-right question, the transfer of land question, the Peruvian quano question, and many other questions now engaging the attention of the agricultural public, resolve themselves into chemical and mechanical improvements in connection with the soil; but they do not embrace the whole of the subject, for they only provide for private landlord-rights and tenant-rights—making no provision whatever for public ones. We intended to have confined ourselves to this latter branch of the subject, taking a tenant-right view of it, so to speak, but soon found ourselves located on that isolated ground where farmers are unfortunately too often found discussing their own interests apart from those of the other arts and branches of industry, as if they could do without railroads, steam-engines, and the like. Then came the Chancellor of the Exchequer's budget, with the revision of the stamp-duties and the prominent item of £200 for a farmer's public tenant-right or landlord's patent, while it is probably only worth £100—the present patent laws making no provision for the "*widow's mite*," but only for the rich man's offering. Necessity, not to mention self-interest, has compelled our manufacturing and commercial towns to talk of cheap patents and public museums for inventions for cultivating the

progress of chemical and mechanical science—a theory long ago supported by the farmers of the New World; and we recommend it to the serious consideration of our own rural provinces: it is worthy of their notice.

Since writing the above, we have seen the valuable communication of C\*\*\*\* in last week's number, and hope the attention of the Royal Agricultural Society of England will be favourably turned to it; further, that the Highland Society of Scotland, the Irish Societies, the London Farmers' Club, &c., &c., will not stand aloof from the interest of the farmer at present, when an opportunity is afforded of settling this branch of his Tenant-right, especially as the Budget balances all rather against him. B.

### PATENTS APPLICABLE TO AGRICULTURAL PURPOSES.

TO THE EDITOR OF THE MARK LANE EXPRESS.

SIR,—Your correspondent B\*\*\*\*, in your number of May 16th, has drawn the attention of your readers to the subject of patents, particularly those applicable to agricultural purposes.

It has often occurred to me that the Royal Agricultural and some other of our leading societies might greatly benefit agriculture by examining some of the many patents that are now lying dormant for want of being fairly started; and if upon examination some were found to combine principles greatly required by the agricultural interest, then let the society vote a portion of their funds for the purpose of giving a fair trial to these inventions, or of aiding the patentees in perfecting their machinery, &c. Suppose, for instance, that the society were to vote an annual sum of £200 or £300 to such a purpose; then let it be agreed that, whatever machinery is made at the expense of the society shall be sold, and the money to go to the fund for assisting patentees; or in the case of inventions not involving machinery, let it be agreed that some equivalent be returned to the society out of the proceeds, sufficient merely to remunerate the society. I believe this would tend far more to the improvement of agricultural machinery, and the bringing out of new inventions, than the custom now followed, viz., that of giving some £2,000 or £3,000 for prizes, a great portion of which is given year after year to the same inventions.

I would not advise that the society should purchase or take out, or enable others to take out patents; but that it should (having well examined into the nature of one or more patents, if any of them were considered likely to benefit agriculture), either through its own engineer or through the medium of the patentees, bring the inventions to a fair trial.

It is all very well to say, Let the patentees bring out their invention; if a good one, we will award them a £50 prize, and we think that sufficient. But, sir, this is not sufficient. A patentee has probably expended all his means in bringing the invention to a certain point. He may have a working model, and have paid for his patent, but is not able to complete a machine that is capable of

practically demonstrating his principle. Well, he advertises for assistance. Possibly he is offered £100 for the invention, possibly not that. Again he tries to get a company to take it up; but this also, after much expense and loss of time, fails. He, then, perhaps, gives it up altogether, or goes to some of the leading implement makers. Well, it may interfere with some patent of theirs, or might throw much of their existing machinery and stock out of use. Of course, they will not try it, or set up an opposition to themselves; and so it comes to pass that the invention is lost.

But, again, there may be an invention which is of very doubtful success, but one that, if brought to perfection, and found to act, would be most beneficial to agriculture. No private individual will advance money to speculate on the chance, much less any implement makers or men in business. Here is a case in which I think the society should step in and defray the expenses of the experiment.

There are, to my own knowledge, at this moment several useful inventions lying idle for want of means to construct the first set of machinery for the society's show at Gloucester, and which will probably never come into use without some such assistance as I have suggested.

A sub-committee of the Royal Agricultural Society, with power to select one or more patents to be experimented on each year, would meet the question, as far as one could reasonably expect.

May 20.

C\*\*\*\*.

### PROGRESS AND PROSPECTS OF THE ROYAL AGRICULTURAL IMPROVEMENT SOCIETY OF IRELAND.

These, as will be seen from the proceedings of the last half-yearly meeting, are highly promising. There can be no doubt of the accuracy of this opinion, as it is borne out by the condensed Report of the Council, which was adopted by the half-yearly meeting of subscribers of Friday last.

That meeting was numerous and influentially attended by subscribers; and the fact that members came up from the far west of Connaught, from Limerick, and Kerry, to attend it, shows what increased anxiety is felt by the public in the society's proceedings and welfare; while the unanimous approval of the Report, and the various resolutions of the council, by such a meeting, must satisfy any reasonable person that the council, its committee, and office-bearers possess the confidence of the public.

The increase of members since January, 1852, will this year add £450 to the income of the society, thus enabling the council not only to defray any extra outlay for the society's *Journal*, but also to furnish the committee for the trial of implements in the Great Exhibition with the £200 voted by the council at the half-yearly meeting. This trial—conducted, as we are satisfied it will be, in a fair and efficient manner during the progress of the Exhibition—will confer a great boon on the agricultural public, and redound to the honour and advantage of this society, which originated the scheme, and who will mature and work it out, at a vast amount of trouble, and no small expense.

These trials, in connection with the Great Exhibition, and



the vast concourse of visitors who will be in Dublin this summer from all parts of Ireland, will, we expect, afford the active friends of the society a most favourable opportunity of adding a great many new members to their list; while the cattle show at Killarney may also be converted into a powerful auxiliary for working out this object, so desirable and useful in itself.

The comfortable accommodation of the Irish Farmers' Club and reading-rooms, and the interest attached to the monthly evening discussion, of the council, combined with the preceding considerations, give good reason for hoping that the society will, in the summer and autumn of 1853, obtain greatly increased confidence and pecuniary support.

THE TOWNLEY CHALLENGE CUP.

Mr. Townley's handsome offer of a 50l. Challenge Cup, to be competed for by tenant farmers, is warmly noticed in the published minutes of the society. This gentleman's liberal conduct cannot fail to excite a keen and improving rivalry, creditable to him and useful to the Irish breeders of stock; and when we say that, in addition to the gift of this cup, we have good reason to believe that whenever Mr. Townley may be so fortunate as to carry off permanently the good old Parcel pledge, he is likely to replace it with one of not less value. Surely such conduct calls for the most grateful acknowledgments of the Irish Society and the Irish people.

Referring then to these proceedings, and especially to the Report, we say the society has progressed, is progressing, and has good reason to hope for an enlarged share of future prosperity. To the public we say—increase your confidence and pecuniary aid, and you will vastly augment the society's power to advance agricultural improvements in Ireland, thereby increasing the social amelioration of the Irish people.

FALKIRK TRYST.

The earliest trace obtainable of this leading market is in 1701. In 1772 the number of cattle exposed there for sale amounted to 24,000:—

“By the year 1812, the number of cattle exposed for sale had increased so much, that Dr. Graham, the agriculturist, informs us that at the August tryst, about 6,000 head of black cattle were exhibited; at the September tryst, fully 15,000 cattle, and the same number of sheep; and at the October tryst, the number averaged from 30,000 to 40,000 cattle, and 25,000 sheep. ‘It appears,’ says this writer, ‘that there are annually exhibited at the trysts above 50,000 black cattle, together with about 40,000 sheep. Taking the former at the moderate average rate of £8, and the latter at that of 15s. each, the value of the whole will amount to £430,000. An intelligent friend, who lives near the spot, calculated that 50,000 black cattle are exposed to sale at the last two trysts alone; and he estimates, on good grounds, that the total value of the cattle bought and sold at these trysts must amount to half a million sterling.’ Within the last forty years, the business has immensely increased, and at a single tryst there is now a larger number of sheep and cattle than at all the three in Dr. Graham's day. At last October (1852) tryst, which was one of the largest that have ever taken place, there were probably not fewer than 80,000 cattle, and 120,000 sheep, not including between 20,000 and 30,000 sheep sold before the market. The tryst of the previous October was about the same size, and there were as many cattle, at any rate, though perhaps not so many sheep. For some years previous to the two last, a falling off had been noticed, but this was no

doubt owing to a dulness of trade, which seems now, fortunately, to have passed away. Good times have once more returned to the sheep farmer and the cattle-grazier, and with them the trysts have revived to all the activity which they manifested some eight or ten years ago. The only permanent loss has been in fat cattle, which are now sent to London direct by steam conveyance, for the feeding districts on the east coast, instead of being brought to the trysts. But it is chiefly as a market for young grazing beasts and sheep that Falkirk Tryst is celebrated, and in these kinds of stock an increase rather than a falling off may be anticipated, as the capabilities of the islands become more developed. Meanwhile, let us endeavour to estimate the amount of business at present transacted. The following may be taken as a near approximation to the numbers and prices of cattle, sheep, and horses for the last two years. In the absence of any exact account, the following estimate of the numbers has been formed, with the assistance of the most competent judges, while the prices have been calculated from correct averages of the different markets:—

AUGUST.		
30,000 cattle at £5 a-head	.....	£150,000
1,000 horses at £15 "	.....	15,000
		£165,000
SEPTEMBER.		
50,000 cattle at £5 a-head	.....	250,000
100,000 sheep at £1 "	.....	100,000
2,000 horses at £15 "	.....	30,000
		380,000
OCTOBER.		
80,000 cattle at £5 a-head	.....	400,000
120,000 sheep at £1 "	.....	120,000
2,000 horses at £15 "	.....	30,000
		550,000

For the year..... £1,095,000

Of this large sum, probably the greater part is paid by English dealers, who individually make by far the largest purchases of any dealers frequenting the trysts; for, while Scotch farmers who wish to stock their lands in most cases attend and buy for themselves, it is the usual custom of English farmers to intrust their orders to agents. The business that thus passes through the hands of a single individual is sometimes very extensive, and we have heard of sums paid away in the course of a forenoon by a single commission agent which would make no paltry figure beside the great business transactions of Glasgow or Liverpool. Turning from the buyers to the sellers, we find the state of matters equally creditable to the enterprise of the Scotch farmers and salesmen, whose transactions are not so very far behind those of the Australian sheepowners as most people imagine. At the tryst in September 1852, one dealer sold upwards of 10,000 sheep. In October he brought forward nearly 15,000, but sold them all before the tryst commenced, owing to the great demand; and another dealer sold about 10,000 sheep at the same tryst. In fact, nearly one-half of the entire sales of sheep are made by some ten or twelve individuals. The most extensive sheepowners in Scotland at present are Mr. James Scott, of Hawick, and Mr. John Kennedy, of Kirkcaldy, better known by the title of one of his Highland farms, Fasfern, on the Lochiel estate. Mr. Kennedy is said to possess from 40,000 to 50,000 sheep, a patriarchal number, which only two or three of the Australian magnates can surpass. Adjoining Fasfern is the farm of Locharkaig, which is rented by a gentleman who is tenant of upwards of a thousand acres of arable land in the county of Roxburgh, and has several other south country farms in his hands. Locharkaig contains, we believe, somewhere about 100,000 acres; it

was stocked with 22,000 sheep, and, like his neighbour Mr. Kennedy, the tenant can ride twenty-five miles on his own farm. But the patriarch of Scotch sheep-farmers and cattle-graziers is Mr. John Cameron of Corrychoillie, who can boast of having brought a greater quantity of stock to Falkirk Tryst than any man living; and no wonder, for, besides the extent of his flocks and herds, he has attended the market for nearly half a century. His transactions are not now so great as they were, but at one time Mr. Cameron used to institute a comparison, not very far out of the way as regards the numbers in either case, between the Duke of Wellington marshalling his army at Waterloo, and his own achievements in leading his sheep and cattle to Falkirk Tryst. Mr. John Paterson of Skinnet, whose death we observe recorded in the newspapers within the last few weeks, was another leading sheep-farmer, and one whose prosperity was entirely owing to his own industry and perseverance. He commenced the world without a shilling, and before he retired from business he had nearly sixty miles of sheep-walks in the county of Sutherland alone.

In a recent work on the wonders of the southern hemisphere,

we read of a Mr. Jeely, who, besides an estate of 50,000 acres, has 'hundreds of thousands of acres of pasture rented from the crown, 25,000 sheep, 3,000 cattle, and some 300 horses.' This is a very tolerable establishment, certainly; but, about a dozen years ago, Corrychoille—by which name Mr. Cameron is well known throughout the country—sent more sheep and cattle to Falkirk, in the course of a single season, than Mr. Jeely possesses altogether. Of course, these great sheep-farmers cannot be present to superintend all their own farming operations, like the agriculturists of the Lowlands, but the sheepwalks do not require the ever-watchful oversight which is essential on an arable farm. A steady shepherd can do all that a master can do, and the care of the flocks may be much more safely intrusted to him than the management of any other business to a deputy. It is this which makes it possible and profitable for one individual to hold farms in different parts of the country; and the practice is, accordingly, very general, and is necessarily followed by all the leading farmers, many of whom reside in the Lowlands, and do not visit their farms oftener than once or twice a-year.—*Hogg's Instructor*.

## ECONOMICAL MODES OF FATTING STOCK.—No. II.

**HOGS.**—Arthur Young, the celebrated agriculturist, made, about seventy years back, several experiments to test the most profitable mode of fattening hogs. He found potatoes given raw, whole peas, peas crushed and given dry, and beans both whole and crushed, alike unprofitable. The mode that succeeded best with him was one he had never tried before—that of keeping the food till sour before being given. He observes, "Hog-cisterns for keeping wash are common in Suffolk, and it is remarkable that the hogs thrive greatly on it when many months old and quite sour; tried the circumstance in fattening, peas, barley, and beans to flour, in the proportion of 25 bushels barley, 18½ peas, and 5½ beans; mixed them with water till rather thicker than milk; four bushels of corn, which make about five of meal, appeared to be a proper quantity for a vessel that holds 100 gallons; filled it up with water, and stirred it thrice a day with a rudder till sour, and during use."

In one experiment, 4 hogs, a cross between a Chinese boar and Berkshire sow (the most profitable breed that A. Young was acquainted with), eat 17 bushels of barley soured, and gave a profit of £1 18s. 9d. besides the manure.

A. Young observes on this method "that the barley or peas should be very dry and good, that they may be ground quite to flour. If they break coarse, the meal does not mix well with the water, which is an essential point. I have tried it of various degrees of thickness—from thin cream to a thick hodge-podge; but I think it does best when it is the thickness of common cream—that is, five bushels of meal to one hundred gallons of water. Much attention should be used in stirring before the hogs are fed, that it may be equally thick; otherwise much meal will be left at the bottom, and more water must be added."

This mode, so highly advocated by Young, is now practised rather generally; still it may prove novel to some of your readers.

A correspondent of Arthur Young's describes the only

mode in which potatoes can be applied profitably in fattening—that of cooking them, which renders the root more digestible, and deprives it of its deleterious properties; and then of mixing some other substance with it, abounding in ingredients in which the potato (itself principally starch) is deficient.

Three large hogs were fattened with a mixture formed of 32 bushels of potatoes (80lbs. to the bushel), 1 cwt. of bran, and 5 bushels tail barley.

"The potatoes were clean washed, and boiled in a furnace; they were taken out hot and beat to a mummy, and at this instant the bran and ground barley added, in the proportion of about 12½lbs. of the latter to one bushel of potatoes. This is the general practice of this county (Hampshire), and potatoes are not supposed to answer for fattening hogs in any other way. The hogs were finished up with 16 bushels of peas."

Although potatoes are more nutritious than any other roots or tubers—containing one-fourth of their weight in solid matter, while Swede turnips contain less than one-tenth, white turnips one-fourteenth, mangold one-tenth, carrot one-sixth, and parsnip one-fifth—yet at the present price they are decidedly dearer than corn for feeding, as in these the proportions of organic matter and water are reversed; and barley, beans, and peas contain only one-sixth to one-eighth of water. Thus barley-meal at 4s. a bushel would be quite as cheap as potatoes at 1s.; and unless potatoes can be afforded at the latter price, they will be a dear and unprofitable food. But probably the real cattle potatoes—as the Yam, the Ox-noble, the red and yellow Cluster, and the Rohan—could be grown at this price; crops affected with the disease could be purchased for even less money per sack, and preserved—if boiled, mashed, and well sprinkled with salt in air-tight cisterns—for a considerable time. Small refuse-potatoes, and those left over at the close of the season, could be often purchased at a very low price.

W.

## AGRICULTURAL BIOGRAPHY.

*(Continued from page 406.)*

## CLXXIX.—ELSTOBB, 1794.

W. Elstobb, engineer, wrote "Historical account of the great level of the fens, called Bedford level, and other fens, marshes, and lowlands in the kingdom, and other places;" Lynn, 1794, 8vo. This work occupies 276 octavo pages, and is not in boards. It was followed by a philosophical treatise on rivers, by the same author, and both works were duly esteemed at the same time.

## CLXXX.—MAXWELL, 1794.

George Maxwell of Hetton, near Stilton, wrote "General view of the agriculture of the county of Huntingdon, and observations on the means of its improvement; with an appendix, containing an account of the advantages to be derived from an improved outfall at the port of Lynn, and answers to the supposed objections. Drawn up for the consideration of the Board of Agriculture and internal improvement;" London, 1794, 4to. This report occupies 47 quarto pages, and the book has escaped the notice of Mr. Loudon, and also the Bibliotheca Britannica. The ideas are short and meagre, and correspondingly expressed.

## CLXXXI.—GRANGER, 1794.

Joseph Granger, land-surveyor, Heugh, near Durham, wrote "General View of the Agriculture of the County of Durham, particularly that part of it extending from the Tyne to the Tees, with observations on the means of its improvement, drawn up for the consideration of the Board of Agriculture, and internal improvement;" London, 1794, 4to. This work fills 74 quarto pages, and was at the time of publication reckoned a good performance. Mr. Granger wrote very truly on the subject.

## CLXXXII.—WALKER, 1794.

D. Walker, No. 14, Upper Marylebone Street, London; wrote "General view of the agriculture of the county of Hertford, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal improvement;" London, 1794, 4to. This work fills 86 quarto pages, the matter is well arranged, and suitably expressed. There is nothing new, or any better performance that deserves a special notice.

## CLXXXIII.—BAILEY, 1794.

Mr. John Bailey, of Chillingham, wrote "General

view of the agriculture of the county of Northumberland, with observations on the means of its improvement. Drawn up for the consideration of the Board of Agriculture and internal improvement;" London 1794, 4to. Mr. George Culley, who has been already noticed, was joined with Mr. Bailey in this performance. The book occupies 63 quarto pages, and has ever been reckoned one of the best of the many reports that were sent to the Board. The enlightened views it contains are seldom printed.

Mr. Bailey was originally from Durham, and lived at Chillingham as land-agent to the Earl of Tankerville. He was a person of very superior abilities, and became an extensive agent for the noblemen of that country. His practical agriculture was first-rate, and the mechanical turn of his mind much advanced the perfection of the threshing implement, and the double drill turnip-seed sowing machine. Mr. Bailey's family were eminent as himself, and are not yet extinct in that county. He wrote "General view of the agriculture of the county of Durham, with observations on the means of its improvement. Drawn up for the consideration of the Board of Agriculture and internal improvement;" London, 1811, 8vo., "General view of the agriculture of the county of Cumberland;" 8vo.

## CLXXXIV.—RENNIE, 1794.

George Rennie wrote "General view of the agriculture of the West Riding of Yorkshire," by Messrs Rennie, Brown, and Shireff; London, 1794, 4to. This work fills 140 quarto pages, and the performance has much repute. The three authors were eminent names. Mr. Rennie was an East-Lothian farmer, and became proprietor of Phantasie near Dunbar, on which his son acted a conspicuous part in varied agriculture. Our present notice was a well-educated practitioner, on whom it showed the attendant effects.

## CLXXXV.—SHIRREFF, 1794.

John Shirreff, of Captain Head, near Haddington, Scotland, wrote "General view of the agriculture of the West Riding of Yorkshire," along with Messrs. Rennie and Brown; and "General view of the agriculture of the Orkney Islands, with observations on the means of their improvement; drawn up for the Board of Agriculture;" Edinburgh, 1804, 8vo. "Method of stacking turnips to preserve them

through the winter;" Nicholson's Journal, xiii., 268, 1806. Mr. Shirreff was a noted agriculturist, and his posterity yet uphold the reputation which he earned.

CLXXXVI.—BROWN, 1794.

Robert Brown farmed at Markle, near Haddington, in the county of East Lothian, and has left behind him a name of no common professional stature. He was the son of John Brown, a respectable merchant in the village of Linton, Preston Kirk, East-Lothian, where Robert was born, 27th August, 1756; and baptized on the 2nd September thereafter. The house of his father, and in which it is believed the subject of this notice was born, is still standing on the east side of the market place or square of the village; a large modern and new lodging-house, built of the red sandstone of the district, and certainly the largest and most respectable in the place.

Robert was one of a numerous family, and having shown a taste for farming, was placed in the farm of West Fortune, in his native parish; which he possessed for nineteen years. Having left this, he became tenant of the farm of Markle within a mile and a-half or two miles of the place of his birth. This is a beautiful agricultural farm, lying in the heart of a beautiful district, and forms as it were a basin round the small but neat farm house, which stands nearly in its centre; now surrounded by trees and shrubs, and separated by its garden from a public road, and looking to the south.

This farm he managed with great skill and industry, and, the times being favourable, with great benefit to himself. East Lothian was then celebrated for its farming, as it is still, but at that time also for a band of eminently successful farmers. With many, or most of these, Mr. Brown was not only acquainted, but on terms of habitual friendship; and they included, among others, Rennie of Phantassie, brother of the late eminent engineer Sir John Rennie, and himself almost as well known in his line; Mr. Andrew Howden, of Lawhead, also a most successful farmer, and respectable though brief writer on farming subjects, &c. Living and conversing with such men, Mr. Brown could hardly have been a bad farmer; for it is well known they are not sparing in their observations on the management of one another. But Mr. Brown soon took a lead, even among these; he also very early began to write upon agriculture, as well as to practise it, and for fifteen years (it is believed) conducted "The Edinburgh Farmer's Magazine," a publication of the greatest value in its day.

When the Edinburgh Encyclopædia began to be published, Mr. Brown was selected to write the article "Agriculture," and which forms a clear and

valuable treatise upon that subject. He afterwards enlarged and improved even this, into a system of rural economy, in two considerable volumes octavo. The correctness of this treatise, and the esteem it gained, may be collected from a passage in a letter to himself, from one of his brother farmers; "Except the bible, I think your book is the best in the world:" and doubtless no writings had then appeared of equal importance on this subject, or which more tended to its improvement.

Occupied in the literary labours we have indicated, and in the diligent cultivation and management of his farm, Mr. Brown continued to reside at Markle, till within a very few years of his death; every year adding to his fortune from both sources, until in the end it was very considerable. At last his wife, the companion of many years, having died in the autumn of 1828, he removed to the house of his son Alexander, then farmer at Drylaw Hill, still nearer Linton. This also is a neat little residence, as most of the East Lothian farmsteads are; standing pleasantly on a slight eminence, as its name imports, but sheltered by a higher eminence behind, and embowered and secluded by trees; and here Mr. Brown died, 14th February, 1831, in his 76th year.

Mr. Brown was early married to a Miss Dudgeon, styled "of Drem," but only the daughter of the farmer of that place; and this is only introduced to remark that the families of farmers often continue to farm the same spots so long, that they seem nearly equally hereditary with those of the landlord. By her he had 14 children, 12 of whom arrived at the estate of men and women, and many still survive.

There is no portrait of Mr. Brown, nor even any perfect cast; but when these remarks were first drawn up, his son Major Brown was in life, and residing where his father died; he was said very much to resemble him. In that case, his features must have been small, the nose inclined to aquiline, and the aspect altogether very gentlemanly and mild and pleasing. He was of middle size, stout and active, and with a wonderfully retentive memory. He was so celebrated for this, as to be able to perform the feat of repeating a column or two of advertisements, without stumbling, if only once or twice read over to him. He appears to have been a pleasing and instructive companion, a kind and just father and head of a family, a good friend, and charitable to the indigent and deserving. One man, who was alive a few years ago in his 84th year, had been in his service for 32 years; and one anecdote at least is important, as showing that his judgment was equal to his kindness. When the savings' banks were instituted, he encouraged his servants to adopt the habit of depositing; and to several who could

plead large families in excuse for the absence of means, he gave £5, that they also might begin.

When Mr. Brown entered his farm of Markle, a great portion of it had been in ley for a long period. To preserve turf-land is still considered good farming in England, and up to this period had been so in Scotland. Mr. Brown took a very different view of this matter, naturally considering such management as next to losing the land. He in consequence broke up every furrow that had ever been cultivated, and added as much more as he could; in short, showed no mercy to whins or to brooms, rushes, stones, or any other accustomed cause of waste. He rooted all out, and turned the space into regularly cultivated land, and the wonder now is, that this had been delayed so long.

It had also up to that period been considered of little consequence to cut corn crops low. It was held that what was not obtained for fodder went for manure; and so it does, but when from the effects of wind and weather it is no longer useful for anything. Mr. Brown not only insisted upon careful cutting on his own farm, but was at pains to record his experience for the benefit of others, and showed, in a way that could not be doubted, that by carefully cutting his crops, he added 15s. an acre to his gains.

It is unnecessary to say more to show that Mr. Brown was a sensible and excellent man and member of society, and a good and practical farmer, as well as a vigorous thinker and writer upon farming, and that in all things he practised what he preached. Not only therefore is his own memory respected, but his own children are respected for him.

He was buried at Prestonkirk, in the church-yard of his native parish; close by the pathway, on the north-east corner of the church, and soon had a monument raised to his memory. It was an upright stone, fitted into a pedestal by sockets, and being of sandstone, had been broken and blown down at the period of collecting the materials for this memoir. But it was lying by the church-wall, and bore this inscription:—

“He was an affectionate friend,  
And kind and exemplary christian,  
And always forward to assist those  
Less successful than himself.”

ALSO,  
IN GRATEFUL REMEMBRANCE OF  
JANE DUDGEON,  
HIS BELOVED SPOUSE,  
WHO DIED 27TH SEPTEMBER, 1828, AGED 60.

THIS MEMORIAL TO PARENTS JUSTLY REVERED,  
IS ERECTED BY  
THEIR AFFECTIONATE CHILDREN.  
1839.

This monument was almost as handsome as could well be erected by the family, without the appearance of ostentation; but considering the importance of Mr. Brown's writings in their day, we think a monument of a very different description should have been erected to him at the public expense.

But the family of Sir John Sinclair have been left in like manner to pay their tribute to his memory, notwithstanding his colossal and almost unspeakably useful labours for the public, and his very great sacrifices of fortune in the same cause. Why these things should be, while miserable conveners of counties, but noblemen, receive expensive monuments, we cannot say. We believe the family of Sir John Sinclair have added the inscription first given by the family of another worthy, in similar circumstances:—

“NON PATRIA, NON IMPERATOR, SED UXOR ET  
LIBERI MERENTES POSUERUNT.”

And at least they were entitled to do so; but what cares the world for such things? Its attentions and neglects are equally casual and inconsequential; and the works of these men will outlive any ordinary monument.

It should not be uninteresting to state that the east, which was at the same time the back-wall of the little school-house, where Mr. Brown and his compeers the Rennies received their education, now forms part of a garden wall, immediately on the road side near the church, and close on the brink of the Tyne; which here runs calm and clear, at the depth of 20 feet beneath a precipitous and wooded bank on the one side, and bordered by a rich flat laugh on the other, and on both sides adorned by trees. It is a scene for a landscape painter, but it has produced none; or for a rural poet, though it has produced neither. On the flat laugh however, in the immediate neighbourhood of the river, is a rustic hamlet, were once lived Andrew Meikle, the mill-wright, the ill-requited inventor of the fanners and thrashing machine and, it must not be forgotten, the first instructor of Sir John Rennie. In his subsequent struggles Meikle was assisted both by the Rennies and Mr. Brown; but in the meantime they were merely scholars, in the small school-house that overlooked his residence.

It may be permitted to add, that though there is little doubt Meikle invented, and with great thought and perseverance worked out, both the fanners and thrashing machine, the Chinese had anticipated Meikle in the fanners at least. In the exhibition of Chinese arts and architecture, &c., &c., that lately shed instruction and delight over the country to many thousands, the fanners appeared in a very simple state, and as a tea-sorter. It

appears to be used for separating the coarse and fine teas, while the thrashing machine is an adaptation of the principles of the flax-mill.

The back window at which these young men doubtless often sat, and which thus let in so much light on the world, was only 2 feet high by 15 or 16 inches wide, and is now built up; but it will be recognisable while the wall stands, and we hope will never be looked upon but with respect.

“Salve, parens merentium! et vale!”

“Parent of merit, hail! and fare thee well!”

Mr. Brown's works have been translated into the French and German languages, and he is quoted by all continental writers as an authority. During his life, many foreigners of the highest rank called to see him; for in every country but this, literary merit is recognised and honoured.

The main informant of these particulars was Mr. Andrew Howden, Lawhead, for many years a friend and admirer of Mr. Brown, and who died only lately in his 83rd year. He was at his death the oldest and perhaps the last of the great race of farmers, who during the last sixty years had accelerated the progress of their science so much.

Law means hill, and Lawhead of course means the top of the hill. Upon such a spot Mr. Howden's very pretty farm-house is situated, close by the humbler but still respectable house in which he was born. He remembered well, that when he was a boy, the hill-head was quite unsheltered; and therefore immediately behind the house, he was accustomed, among other things, to cut whins for the oven.

The farm steading is now completely sheltered, and where whins grew is now a rich and beautifully sheltered garden; and in a glen immediately adjoining, on the north, and which was then covered with heath and stone, and with a plashy brook running through it in winter, is now a rich and crowded orchard, and it may be added a well stocked apiary.

“These works are thine, all-powerful shelter! thine The fruits and flowers, with the now genial clime.”

From this eminence, Mr. Howden while he lived could look down on a larger space of agricultural wealth and continuous rural beauty, than perhaps any other man in the kingdom; and thinking of himself and his late companions, could have said with truth, “fecimus ipsi!” “we have made it!” He also has left a considerable and prosperous family; and though there was no affectation of splendour in his house, royalty itself might have sat down with pleasure, in his neat and comfortable apartments, and at his well served table.

To see indeed, the glory of her reign,

The happy, pious, and industrious swain.

Mr. Brown was a professional practitioner in farming of the very first class of the art. The two volumes on “Rural affairs” stand on high ground, and he assisted in collating county reports along with the eminent names of Rennie, Bailey, and Shirreff. His apprehension was no less just than his judgment was correct, and though he acted under very favourable circumstances as to soil and climate, his allowance for altered circumstances showed a largeness of mind that does not always attend a single merit. His name must ever be placed among the foremost of agricultural writers.

#### CLXXXVII.—VANCOUVER, 1794.

Charles Vancouver, Esq., land valuer, wrote “General view of the agriculture in the county of Essex, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal improvement;” London, 1794, 4to. “General view of the agriculture of the county of Devon, with observations on the means of its improvement;” London, 1807, 8vo. “General view of the agriculture of Hampshire and the Isle of Wight, with observations on the means of its improvement; drawn up for the Board of Agriculture;” 1811, 8vo. These reports are done in a superior manner, and a neatly coloured map accompanies each county.

#### CLXXXVIII.—LEBROCC, 1794.

Philip Lebrocq, M.A., and curate of Ealing, wrote “Outlines of a plan for improving the tract of land called the New Forest;” London, 1794, 8vo. This notice appears in Loudon's list of authors, and in the Bibliotheca Britannica, but the book is not found in the National Library. One work of our author is found, entitled, “Methods of planting, trimming, and managing all kinds of fruit trees and vines.” Lebrocq wrote “On the management of the poor, and the payment of the national debt.” His writings do not seem to have attracted any notice, and the name has no eulogium attached.

#### CLXXXIX.—CLARIDGE, 1794.

John Claridge, of Craigs' Court, London, wrote “General view of the agriculture of the county of Dorset;” London, 1794, 4to. This book occupies 49 quarto pages, and seems judiciously performed.

#### CXC.—GRIGGS, 1794.

Messrs. Griggs, of Hill house, near Kelvedon, Essex, wrote “General view of the agriculture of the county of Essex, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal improvement;” London, 1794, 4to. This is a short report of 26 octavo pages, and is seldom noticed. But the information seems to be sufficiently correct, and the remarks are judicious.

## CXCI.—TURNER, 1794.

George Turner, of Dowdeswell, wrote "General view of the agriculture of the county of Gloucester, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal improvement;" London, 1794, 4to. This report fills 57 quarto pages, without any embellishments. The common topics are handled and discussed.

## CXCII.—DRIVER, 1794.

Abraham and William Driver, of Kent Road, Surrey, agents and land surveyors, wrote "General view of the agriculture of the county of Hants, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal improvement;" London, 1794, 4to. The report fills 44 octavo pages, and claims no particular notice.

## CXCIII.—WARNER, 1794.

The Rev. Mr. Warner wrote "General view of the agriculture of the Isle of Wight, with observations on the means of its improvement." This short report is without date, and forms part of a quarto volume with other reports.

## CXCIV.—PITT, 1794.

William Pitt, of Pendeford, near Wolverhampton, wrote "General view of the agriculture of the county of Stafford, with observations on the means of its improvement; drawn up for the Board of Agriculture;" London, 1794, 8vo. "General view of the county of Leicester, with that of Rutland, by Richard Parkinson;" London, 1809, 8vo. "General view of the agriculture of Northamptonshire;" London, 1809, 8vo. The report of the county of Stafford contains a neatly coloured map, and occupies 168 quarto pages. It is a well arranged work and a useful reference. The county of Northampton forms an octavo book of 320 pages, with a coloured map. The counties of Leicester and Rutland form a thick octavo volume, with coloured maps, and designs of houses and cottages; implements also are delineated. The name of this author has always been very favourably considered in the agricultural world, and our opinion agrees.

## CXCv.—ROBSON, 1794.

James Robson wrote "General view of the agriculture of the county of Argyle, and of the western part of the county of Inverness;" London, 1794, 4to. This work occupies 58 quarto pages, and is a very mediocre production.

## CXCVI.—LEATHAM, 1794.

Isaac Leatham, of Barton, near Malton, Yorkshire, wrote "General view of the agriculture of the East Riding of Yorkshire, with observations on the

means of its improvement; drawn up for the consideration of the Board of Agriculture and internal improvement;" London, 1794, 4to. The work occupies 63 quarto pages, and is illustrated with plans of houses and farmeries.

## CXCvII.—FULLARTON, 1794.

Col. Fullarton, of Fullarton, wrote "General view of the county of Ayr, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal improvement;" London, 1794, 4to. The work fills 94 quarto pages, and is one of the best of the Scotch surveys.

## CXCvIII.—TUBE, 1794.

Mr. Tuke, Junior, land surveyor, Lincroft, near York, wrote "General view of the agriculture of the North Riding of Yorkshire; drawn up for the Board of Agriculture;" London, 1794, 4to. The work fills 123 quarto pages, and was printed in 1800, with 15 plates, in an octavo form. The report possessed a merit at the time.

## CXCIX.—CLARK, 1794.

John Clark, F.S.A., land surveyor, Builth, Breconshire, wrote "General view of the agriculture of the county of Brecknock, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture;" London, 1794, 8vo. "General view of the agriculture of the county of Radnor;" London, 1794, 4to. "General view of the agriculture of the county of Hereford;" London, 1794, 4to. "An enquiry into the nature and value of landed property." Mr. Clark died at Pembroke, in 1807. He wrote on other subjects: "On the Caledonian bards," and "The poems of Ossian," which are not now found, nor is the "Enquiry into the nature of landed property." The three county reports are in quarto size, of 55, 41, and 79 pages, and are managed in a superior style.

## CC.—LLOYD, 1794.

Thomas Lloyd, Esq., and Rev. Mr. Turner, wrote "General view of the county of Cardigan, with observations on the means of its improvement; drawn up for the Board of Agriculture and internal Improvement;" London, 1794, 4to. The work fills 37 quarto pages, and is concisely and neatly executed. Very improving experiments are recorded and further attainments pointed out.

## CCI.—HASSALL, 1794.

Charles Hassall wrote "General view of the agriculture of the county of Carmarthen, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. "General view of the agriculture of

the county of Pembroke;" 1794, 4to. These reports occupy 63 and 52 pages of quarto size, and present nothing of particular notice.

CCII.—KAY, 1794.

George Kay wrote "General view of the agriculture of North Wales—Anglesey, Carnarvonshire, Merionethshire, and Denbighshire;" London, 1794, 4to. These reports are short, only 16 pages in some cases, and consequently can convey but little information, yet they rank with others without discredit. The name of the author had wholly escaped Mr. Loudon's list, and also the *Bibliotheca Britannica*, as no notice occurs of it, nor of the last writer, Charles Hassall.

CCIII.—ROGER, 1794.

Rev. Mr. Roger wrote "General view of the agriculture of the county of Angus or Forfar, for the consideration of the Board of Agriculture;" London, 1794, 4to. The report is only of 31 pages, and contains valuable matter in a small compass.

CCIV.—LOWE, 1794.

Alexander Lowe wrote "General view of the agriculture of the county of Berwick, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. This report fills 90 quarto pages, of very great merit, as ever has been acknowledged. A geological map of the county accompanies the report, and figures of several implements of uncommon structure. Mr. Lowe was a person of noted talent.

CCV.—BRUCE, 1794.

Arthur Bruce, secretary to the Natural History Society of Edinburgh, wrote "General view of the agriculture of the county of Berwick, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement." This work is printed as an appendix to the former work by Lowe, and occupies 46 quarto pages. The two reports together form a work that was not equalled in the whole number of county surveys.

CCVI.—BOYS, 1794.

John Boys, farmer at Betschanger, near Deal, wrote, "General view of the agriculture of the county of Kent, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. This report occupies 107 octavo pages, and general opinion has ever given it the palm of county reports of agriculture, for soundness of judgment and enlightened practical views.

CCVII.—HOLT, 1794.

John Holt, of Walton, near Liverpool, wrote "General view of the agriculture of the county of Lancaster, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. This report fills 114 quarto pages, and has the county mapped in colours. It is a very respectable performance.

CCVIII.—MONK, 1794.

John Monk, (late of the 19th Light Dragoons,) of Bears Combe, near Kingsbridge, Devon, wrote "General view of the county of Leicester, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. This report occupies 75 quarto pages, and is illustrated with drawings of several implements. The merit is ordinary.

CCIX.—FOOT, 1794.

Peter Foot, land surveyor, Dean-street, Soho, wrote "General view of the agriculture of the county of Middlesex, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. This view fills 92 quarto pages, and was always reckoned a superior work.

CCX.—FOX, 1794.

Mr. John Fox wrote "General view of the agriculture of the county of Monmouth, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. This report fills 43 quarto pages of the customary matter in those days.

CCXI.—PEARCE, 1794.

William Pearce wrote "General view of the agriculture of Berkshire;" London, 1794, 8vo. The work fills 74 quarto pages, and is illustrated with engravings of ploughs and cottage dwellings. The royal farms at Windsor are described. No other notice of this author occurs in any place.

CCXII.—AMOS, 1794.

William Amos, of Brothertoft, near Boston, Lincolnshire, wrote "The theory and practice of the drill husbandry, founded upon philosophical principles and confirmed by experience;" with 9 plates. London, 1790, 4to. "Minutes of agriculture and planting, illustrated with specimens of eight sorts of the best, and two sorts of the worst natural grasses, and with accurate drawings and descrip-



tions of practical machines, on seven copperplates, &c;" London, 1804 and 1810, 4to. "Essays on agricultural mechanics, from communications to the Board of Agriculture;" London, 1810, 8vo.

The works of Amos have ever been very deservedly esteemed. The drill husbandry is most justly placed on the true grounds of superiority, and full directions are given on every point of use and preparation. The book is a quarto volume of 244 pages, embellished with drawings of machines and the sectional parts. The author carried his drilling hobby to an extreme; hoed every crop, as oats and peas, and may have bid farewell to discretion on that point; but his views are very just.

"The minutes of agriculture and planting" form a quarto volume of 92 pages, with drawings of several implements, and dried specimens of many grass plants. On this subject the author shows a good botanical knowledge, and also of vegetable physiology. The "essays on agricultural machines" fill 32 octavo pages, with drawings of implements. The author shows a very accurate knowledge of the two-horse swing plough, which is neatly delineated with the horses attached. The whole works exhibit a very superior mind employing an enlightened practical knowledge.

#### CCXIII.—ADAMS, 1794.

James Adams, Esq., wrote "Practical essays on agriculture;" 1794, 2 vols., 8vo., price 14s. This statement rests on the authority of the *Bibliotheca Britannica*, as the author is not noticed in Loudon's list of authors, nor in the catalogue of the National Library.

#### CCXIV.—WEDGE, 1794.

Mr. Thomas Wedge wrote "General view of the agriculture of the County Palatine of Chester, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. This work fills 87 quarto pages of the usual matter, with an appendix on the poor laws. The subject is concisely treated, but nothing new or comprehensively enlarged is promulgated, nor much thought expressed. Our research found the work in George IV's library, in the British Museum, and is not noticed in any catalogue of authors and books.

#### CCXV.—WEDGE, 1794.

Mr. John Wedge wrote "General view of the agriculture of the county of Warwick, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. The work fills 60 octavo pages, with a long appendix on draining land by boring, on the plan

of Mr. Elkington. This book was discovered, as the last, in George IV's library; no notice of it is found elsewhere.

#### CCXVI.—BISHTON, 1794.

I. Bishton of Kilsal, Shropshire, wrote "General view of the agriculture of the county of Salop, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. The book occupies 38 quarto pages, and seems to be one of the meanest county reports.

#### CCXVII.—BROWN, 1794.

Thomas Brown of Luton, in Bedfordshire, wrote "General view of the agriculture of the county of Derby, with observations on its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. This work fills 72 quarto pages, embellished with a plan of a dairy farm building, and a geological map of the very interesting geography of that county. The plough of Derbyshire is delineated, along with scythes and rakes for cutting and gathering the crops of grain.

#### CCXVIII.—POMEROY, 1794.

William Thomas Pomeroy of Fairway, near Honiton, in Devonshire, wrote "General view of the agriculture of the county of Worcester, with observations on the means of its improvement; drawn up for the Board of Agriculture and internal Improvement;" London, 1794, 4to. This work contains 94 quarto pages of well arranged matter, containing information superior to the general reports.

#### CCXIX.—DAVIS, 1794.

Thomas Davis, Longleat, Wilts, wrote "General view of the agriculture of the county of Wilts, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. This author was land-steward to the Marquis of Bath, and a person of superior acquirements. The present work occupies 163 quarto pages, without any embellishments, except a plain map of the county, and has always been reckoned one of the best county reports. The heads of matter are numerous, and the details are well entered and explained.

#### CCXX.—CRUTCHLEY, 1794.

John Crutchley, of Burley, in the county of Rutland, wrote "General view of the agriculture of the county of Rutland, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improve-

ment;" London, 1795, 4to. This book occupies only 34 quarto pages, and has been little noticed.

CCXXI.—MALCOLM, 1794.

Mr. Jacob Malcolm and Mr. William James of Stockwell, near Clapham, wrote "General view of the agriculture of the county of Surrey, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. There are 95 quarto pages in this work of very useful and varied matter, not very methodically arranged, but handsomely expressed. Two portraits are given of a horse-hoe, and of a turnpike road, with raised footpaths at the sides. The observations are peculiarly valuable on common lands, and the general impediments to agriculture.

CCXXII.—DAVIS, 1794.

Richard Davis, of Lewknor, in the county of Oxford, topographer to His Majesty, wrote "General view of the agriculture of the county of Oxford, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. This is a very meagre report of 39 quarto pages, and was little noticed.

CCXXIII.—HEPBURN, 1794.

George Buchan Hepburn Esq., of Smeaton, wrote "General view of the agriculture and rural economy of East Lothian, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. This report occupies 157 quarto pages, and was always reckoned

one of the best of the many county views that were received by the Board of Agriculture.

CCXXIV.—ROBERTSON, 1794.

George Robertson, farmer at Granton, near Edinburgh, wrote "General view of the agriculture of the county of Mid-Lothian, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. This report occupies 106 quarto pages, and enjoyed a good reputation both in matter and style. Two appendices contain very useful notices of the dairy and gardens.

CCXXV.—TROTTER, 1794.

James Trotter, farmer at Newton, county of West Lothian, wrote "General view of the agriculture of the said county, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" Edinburgh, 1794, 4to. This report occupies only 38 quarto pages, but the matter is most intelligent and well arranged.

CCXXVI.—ROBERTSON, 1794.

James Robertson, D.D., minister of Callander, in the county of Perth, wrote "General view of the Southern districts of the county of Perth, with observations on the means of its improvement; drawn up for the consideration of the Board of Agriculture and internal Improvement;" London, 1794, 4to. This report occupies 140 quarto pages, and was always noted for the very superior proposals of improvements in general husbandry. The opinion seems to have been well founded

## NEW TIMBER TREE—THE DEODAR.

It appears that we are to have a new timber tree, and a new nurse for our timber trees. We learn from several articles which have recently appeared in the columns of a contemporary, that doubts are entertained by some botanists whether the deodar is anything more than a mere variety of the cedar of Lebanon. These doubts, however, are not participated in by the Editor. At any rate, he considers that if the deodar and the cedar are only varieties of the same species, there is sufficient distinctness between them for their timber to be of very different qualities. This is an important economical question, if the deodar is to be naturalised in England; and it seems that a ton weight of the seed has been placed by the East India Company at the disposal of the Government, and that it has been distributed among four eminent nurserymen, who are to

raise it, in order to its being planted out in the royal forests. Great advantages are anticipated from this tree as a nurse, instead of the Scotch pine and the larch. Against the former it is justly alleged that its foliage is so dense as to intercept the light and air from the deciduous trees planted in company with it. The benefits of shelter from gales of wind which it confers during one stage of their growth are thus neutralised by its obstructing proper ventilation at another. Its poles, moreover, are of little value. The poles of the larch, on the contrary, are very saleable; while its pyramidal form and light foliage do not interfere with the free circulation of air; but then these very circumstances incapacitate it, in a great measure, from affording that degree of shelter which is sought to be attained by the system of nurse-planting. Its

liability to the rot, which has made its appearance of late in this once favourite exotic timber tree, neutralises the advantages arising from the marketability of its poles. The deodar, on the contrary, is extolled as combining the rapid growth and graceful form of the larch with the evergreen habit of the Scotch pine. It is therefore hoped that it will furnish our planters with an excellent nurse for their oaks, while a host of Indian travellers are cited to prove the excellence of its timber.

We confess to having great doubts, founded on extensive observation, respecting the policy of mixing any of the conifers with the oak as nurses, where the production of large timber is the object in view, whatever advantages may be derived from the nursing system when rapid growth and pictorial effect are to be produced in ornamental planting.

We believe that the British oak has not degenerated since the time when it sprang up spontaneously in our forests, unprotected except by the holly in its earlier stages, and in more advanced growth by deciduous trees like itself. In those parts of the New Forest which are of natural growth, the beech is the constant companion of the finest oaks. The same association has been noticed by Shelley, in the "Forest of Windsor":

"The oak,  
Extending its immense and knotty arms,  
Embraces the light beech."

The beech affords shelter enough, and not too much. It springs up like a weed; and all that is required is that it should be watched, lest from its more rapid growth it should overpower the oak.

One reason of the difficulty now experienced in raising oak in situations where we have evidence in our bogs of the former existence of the finest timber, arises from the smallness of the scale on which plantations are made. In the modern plantations of the New Forest, as well as in those natural masses of wood that have grown up spontaneously, the cutting effects of the blast do not extend more than a few yards from the outskirts. The larch likewise has been raised in far more elevated and exposed situations, on the mountains of Blair Athol, simply by planting in large masses. These, then, appear to be the secrets of successful planting—to plant in large masses, to plant thickly, and to thin in good time, thinning moderately and regularly. If conifers are to be planted to break the force of prevailing winds, it is better that they should form separate belts than that they should be intermixed with the oaks.

The question whether the oak should be transplanted or raised from the acorn where it is to grow, depends very much on the purposes for

which it is raised. In the early stages of growth, perhaps transplanted oaks may do the best, and may yield as good small timber as the untransplanted saplings, and much trouble and disappointment may be avoided in the outset arising from the ravages of rooks and various kinds of vermin. But the superiority of an old "rook-planted" oak is well known to woodmen; and if naval timber is worth growing, it is surely worth a little extra trouble and expense in its infancy.

We do not enter on the questions whether it is better, in the present state of this country, that we should raise the timber for our navy or import it—whether a sufficient supply can or cannot be obtained without keeping up public forests for the purpose—and whether, if our timber is to be of home growth, we can depend upon obtaining a sufficiency from private estates. What is certain is, that the royal forests have for a long time contributed very little timber to our dockyards, and that the growth of oak for sale has been a very unprofitable speculation in the hands of the Government. We doubt whether the growth of the deodar will be found more remunerative, under the same management; at all events, it is desirable that it should not be introduced extensively into our forests merely on the evidence of travellers as to the quality of the timber. Why not bring a few loads of it to England for trial? The experiment of bringing timber from Cashmere may be costly, but it might save money eventually. It would be far more expensive to plant a large quantity of these trees, and to find, after the lapse of a hundred or hundred and fifty years, that we had made a mistake. Great expectations were formed at one time as to the value of larch for ship-building. Where are they now? The oak and the beech, however, still stand their ground in our forests.

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A French market-gardener, M. Felix Lansenzeur, who has volunteered to publish some secrets relative to the use of guano, which have been of great value to himself, in order, as he says, to prevent England getting ahead of France in the growth of plants, makes the following statement, on which we leave our readers to form their own opinion:—"An important observation, which I must not forget to mention, is, that the effect of guano on plants placed in the shade is not merely negative, but appears to be even injurious. Plants in this condition have become languishing after its use. The sun is here an indispensable auxiliary. Hence, it is when it begins to be powerful that the use of the mixture in question (guano and water) should be commenced, and discontinued in the beginning of September."

## AGRICULTURAL STATISTICS.

Whatever may be the evils of the hop-tax, it possesses this advantage—it furnishes us with trustworthy statistics respecting that article of agricultural produce. An equally correct knowledge of the annual produce of other crops, and of the yearly consumption of meat, butter, cheese, &c., would be advantageous alike to producers and consumers. To be useful, however, statistics should be accurate; and to ensure accuracy, it will be necessary to proceed cautiously, neither trying too much in the outset, nor attempting anything which will excite the opposition of the tenant farmers, or fail to receive their cordial co-operation.

It would be a great point gained, to obtain correct returns of the extent of land under each description of crop. From these, and an extended system of corn returns, it would be possible, with time and patience, to extract a knowledge of the average produce of different districts, for a succession of years, and its progressive increase or diminution, without trespassing on the privacy of individual transactions.

Farmers have long complained of the insufficiency of the present corn returns, as affecting them injuriously in the adjustment of the tithe commutation; more stringent provisions for the enforcement of such returns would therefore be acceptable to them. A comparison of the sales of each description of grain, and the area cropped with it during preceding years, together with a knowledge of the extent of land sown with it for the current year, would enable those interested in the adjustment of the supply to the demand, whether as producers, importers, or consumers, to arrive at more trustworthy conclusions, on which to base their operations, than could be derived from estimates of the produce of the growing crops. Such estimates, made by the most experienced valuers, are little better than mere guesses, and are liable to great derangements within a short time, from changes in the weather. We should have more faith in returns, could they be obtained, of the cubic contents of the stacks of each description of corn taken immediately after harvest.

With respect to animals, returns of the numbers of the stock existing in any district might as easily be obtained as returns of the land under each crop; and returns of sales from the live and dead markets, and from fairs might also be rendered imperative. Much valuable information respecting the fluctuations in the sources of supply for particular districts would be gained, if railways

and road trusts were bound to furnish returns of the number of animals conveyed along their lines, or paying toll at their gates.

The most complete information of all, would be that obtained by returns from the farmers, of their annual produce; but to obtain this would be nearly impossible. They are not yet prepared for a compulsory enactment of this kind, and probably never will be.

The case of the United States, so often appealed to, in proof of the facility with which agricultural statistics may be obtained under the most popular form of government, is not in point. The British and American farmers are in a very different position. The American farmer is his own landlord, and has no fears that a return of his crops will lead to the raising of his rent.

The agricultural statistics of the United States have, till recently, been collected by the Board of Commissioners of Patents. The power of granting patents is a right of the Federal Government; and a Commission of Patents, with a Museum of models of Inventions, has for some time existed at Washington. The report of this Board to Congress, printed for general distribution, had gradually been made to embrace nearly the whole range of rural affairs, both practical and theoretical, in addition to descriptions of new machinery and patent processes, and had thus become the more valuable to statisticians and rural economists than to mechanics. This incongruity, combined with the importance and practical nature of the agricultural part of the report, and the paramount importance of agriculture among the industrial occupations of the States, has led to the appointment of a separate agricultural board, which will occupy itself with everything connected with the present condition and improvement of the numerous departments of rural industry, which flourish under the various climates and on the various soils of that extended territory, or which may be capable of being introduced into it. It will embrace the political economy, the statistics, the theory and the practice, of all the rural arts. A museum of implements and seeds; a dépôt of foreign seeds for general distribution; a chemist and a laboratory of research, together with a literary officer well acquainted with practical agriculture, to digest and methodise the matter contributed by others for the report, will constitute the establishment, which will be under the immediate direction of the Secretary of State.

It will effect, in point of fact, that which is done

in this country by the Royal Agricultural Societies of England and Ireland, and the Highland Society of Scotland, for the practice of agriculture, combined with what the government will do in the matter of statistics through the Board of Trade, and in the matter of agricultural education through its department of the College of Practical Science—that is to say, unless the interests of so important a branch of national industry as agriculture are to be as much neglected at that establishment as they have been hitherto.

There is reason, however, to believe that the American agricultural statistics are not the most accurate in the world, as respects the grain producing powers of the country. They have consisted, hitherto, chiefly of returns of the *estimated produce* of growing crops sent in from the different States; and if they at all approached to correctness, the grain exported from the United States ought to be much larger than it is. The Patent Office returns, for instance, estimated the produce of the State of Michigan for 1847 at 8,000,000 bushels of wheat; whereas the report of the authorities of the State reported the actual produce for 1848 at no more than 3,700,000 bushels.

These estimates may be considered in a great measure as the returns of the farmers themselves;

and the position of the American farmer as a land-owner is attended with many circumstances which have a tendency to produce exaggerated estimates of produce. They increase his importance and raise his credit in his own neighbourhood; they add to the market value of his land when he wants to sell it; and a large portion of the cultivators of America, particularly in the new States, are men who reclaim wild lands, exhaust their productiveness by hard cropping, sell them for what they can get, or abandon them to a state of nature, and then plunge again into the forest to reclaim more. There would be none of these tendencies to exaggeration in this country: the bias would be in the opposite direction. But, knowing how uncertain such estimates are, and that the farmer himself knows little about the yield of his crops till he has thrashed a considerable portion of them, we should say—if we are to have a system of Agricultural Statistics in this country, let them be collected by the Government; let us have nothing to do with estimates of growing crops, but let us have accurate returns of the land under each description of crop, and endeavour to arrive circuitously at the average yield, not of farms, but of districts, through district returns of actual sales.

#### ON THE CONSTRUCTION OF COTTAGES FOR THE AGRICULTURAL LABOURER.

We are glad to observe that, generally, amongst landed proprietors, greater attention is being paid to the proper principles of constructing cottages for the agricultural labourer than heretofore. While almost universal and deserved reprobation has visited the holes, rather than dwellings, of the court and alley population of our great towns, and the cellar inhabitants of others, huddled together as they are in darkness, in close, stenching, filthy, undrained rooms, called dwellings, until now less notice has been taken of the low, ill-lighted, ill-drained, ill-ventilated cottages of the agricultural labourer. But the reason is obvious: the latter is always a healthy man, compared with the former. He lives in the open air, and has that blessed stimulus applied to every pore of his skin; exposed often by throwing off his coat while working, he has abundant perspiration, and almost always fresh, clear spring-water, which more than compensates for the ill-arranged, small, and unsuitable dwelling. But he, and his wife and children, happily tenant it only few hours of the day; they bask, or work, or play, as the case may be, under the canopy of

heaven, cheered and warmed by the genial rays of the sun.

These are reasons why little attention has until of late been paid to the cottages of the labouring classes in the agricultural districts; they are mostly old, and often nearly untenable. But we are happy to see that some of the great landowners, such as the Dukes of Bedford and Northumberland, and several others, are taking up the subject in good earnest; and one of these noblemen has ordered, we are informed, the erection of some two hundred and fifty on his estates.

But it is not large proprietors alone who know how to erect excellent cottages. We were agreeably surprised on visiting the location called by the uneuphonious name of Snig's End, to find even there some of the cheapest and best arranged cottages in the kingdom, with one story only—the ground floor; well lighted, well ventilated, well arranged with every convenience, and yet erected so cheaply as to be deserving of being taken as models by the architect of the most lordly proprietor. We have not, on the whole, seen them surpassed. The

centre part of the cottage was the living room of the family, well fitted with oven and range, well lighted, and amply ventilated both by the door and the large windows, which could be opened as far as half their area. On each side of this were the two wings, so to speak, of the dwelling, which consisted of two lodging rooms, equally well lighted, and admirably ventilated. Behind the living room was a lean-to, to be used either as a scullery or dairy, according to the requirements of the occupant. This had a door nearly opposite the out door, and a window opposite to that, so that when both doors and one window were opened the whole would be thoroughly and speedily ventilated by a proper draught. There were two or three useful closets, and the houses had ample drainage provision, possessing at the same time the means of detaining the manurial part of the residuum of the house. The conveniences were situate out of sight, and far from the windows—being, in fact, eligibly placed below the side of the bedroom, where it had no window. A still greater advantage was the amazing cheapness of these houses. We are afraid to say that about £50 each was represented to us as their cost: but it must be observed that all the materials were got on the estate, and all manufactured in large quantities. There was clay for bricks, quarries for slate, kilns for lime, and the larch plantations afforded timber for the houses; but how many of our large landed proprietors have similar facilities if they would but use them!

We have not seen much more judiciously arranged cottages, of a still better class, than those we had the pleasure of looking over, erected by Heaton Clarke, Esq., of Ellingthorpe, near Boroughbridge; whose well-managed farm deserves to have labourers who reside in respectable and comfortable dwellings. There is more accommodation than in the Snig's End Cottages—having two stories, more lodging and washing conveniences, and bed-rooms sufficiently lofty, airy, and well-lighted to make

them pleasant and healthy. A well-arranged plan gives a large amount of healthy accommodation in a small space. The lodging rooms, though somewhat small in area, were really large because lofty; and it struck us what great comfort there seemed to be for any one of the labourers who might be confined to his bed or out of health, so as to be quiet and separate.

We cannot but reprobate the disposition of architects of the present day in making cottages for agricultural labourers fanciful and expensive. We think health, space, light, ventilation, and drainage far beyond the mere pleasing of the eye. This often deters a proprietor from beginning. He has estimates of £100 each for agricultural cottages, the rent of which he cannot charge above £3 10s. or £4 per annum. If he could build three for what two would cost, he might do so; but nothing more than useless, and even fantastic ornaments, we are persuaded, keep many proprietors from doing a little year after year in amending their labourers' residences.

Mr. Clarke's cottages are built just to steer between the two extremes; they are neither highly ornamented nor erected without regard to appearance. They are extremely neat, and even pretty; but their ornaments are not of that kind involving great cost, and more is aimed at in imparting light by a larger window—as shown by an elevation of the roof—the ornamental being in fact made subservient to comfort, and not *vice versa*, as is too often the case. They are colonized without crowding, being joined together in pairs, having the advantage of mutual assistance, without too close proximity.

The cleanliness, health, and even moral condition of the agricultural labourer is too much bound up with a better class of dwellings than, we lament to think, they usually possess, not to render the question one of practical interest to all improvers of their estates, throughout the United Kingdom.

## RAISING TURNIPS ON CLAY LANDS.

BY J. D.

Observation has marked the evidence, and experience has confirmed the fact, that the small seeds of vegetable life require, in which to indulge their peculiar nature and habits, a correspondingly small quantity of a finely comminuted earthy pulverization, which seems essential to act the part of cherishing and supporting the germination and tender condition of the plant. In this uppermost layer of earth, which is produced by various causes,

fibrous roots creep horizontally, for the purpose of collecting nutriment; and tap roots descend into the firm ground underneath for the same purpose, after having acquired the necessary strength from the encouragement of the fine pulverization.

Observation has also seen that any finely comminuted earth is the most friendly to vegetation when first used, after a concealment from exposure to the effects of waste by evaporation and abduc-

tion caused by the natural elements; also the fertility and total destruction of weeds on the ground where the ricks of hay or corn have stood, and of old fences and foundations of houses; which all arise from the fresh contact of external elements that have been long separated. When a rock, log of wood, or any substantial body, lies upon a grassy surface, all vegetation dies below it, and a strong growth protrudes at the sides of the body. A decomposition takes place underneath the substance, which is reached by the roots of the grass plants at the sides; and, as food is received in some way or other by the roots of plants, the growth is promoted, as is seen in every case of a covering to the ground. The amazing vegetable growth in snowy countries, as in Russia and Siberia, arises from the sheltered covering of the ground so long by the deep snows; and the farmers in Scotland expect good crops after a winter of heavy snows, which arises from the same cause. The ashes of paring and burning have been spread on the unploughed surface of the ground; the turnip seed has been sown among the ashes, and the crop of vegetables has been equal to that grown on the contiguous land that was ploughed and harrowed in the usual way. The tap root descends without difficulty into the unmoved soil, after the growth is encouraged by the ashes. The seeds of turnips, dropped by accident on any fine earth on the sides of banks and roads, show a very vigorous growth, and a bulb would be produced if the due encouragement were given.

In accordance with the above undeniable evidences, it is proposed, by imitating nature, to raise turnips on clay lands that are hitherto reckoned wholly beyond the possibility of being made to grow the turnip plants; to produce a fine mould on the surface, with which to mix an equally fine manure, and in which to sow the turnip seed, allowing the tap to descend in its own way, as has been before mentioned. The land must be covered on the autumnal stubble in sufficient thickness to prevent the access of light to encourage weeds, and to kill the vegetable life of every kind—which is more completely effected than by any fallowing of the land by means of the smothering exclusion of light and heat. The covering would be lifted in March, when the surface of the ground will be scarified to the depth of two or three inches, by means of a one-horse implement of a light weight, and with three tines or coulter with a triangular apex. The covering being relaid will remain till the middle of May, when the removal will permit the land to be again scarified and mixed with the fine manures, as guano and bones, or farm yard dung that is fine in the excrements and short in the straw, from the latter having been cut into short lengths for the

purpose of litter. The scarifying is done lengthwise and crosswise, and repeated till a most minute and intimate mixture be effected of the soil and manure, which must be pulverized till the process fails to produce any further reduction. The covering is again replaced, and removed in June, when the turnip seed is sown in rows by means of a machine with lengthened coulter, covered by a bush harrow, and protected by a rolling across the ground. The damp exhalations from the covered surface will produce a strong and rapid growth of vegetation, which will seek downwards by the roots in order to extend itself, and answer the purpose of nature. This result is seen from every exposure of earth that has been concealed; fresh elements are engendered, which spring into action immediately on coming into contact with atmospheric bodies. The moisture has been kept in the ground by the covering, which, by long overlapping at the joints, receives the rains to be spread over the surface underneath; and that element, along with the strongest heat of summer, will produce a very vigorous and lasting vegetation, which will be pushed forward by dung, moisture, heat, and earth. The amazing vegetable profusion of the tropical regions arises from the great quantity of moisture acted upon by the powerful heat of the sun. It is here imitated. The benefit conferred upon land by green crops, as turnips and potatoes, arises in a large degree from the ground being covered by the broad succulent leaves which protect the surface, exclude drought and the rays of the sun, retain moisture, and promote a decomposition underneath the shade. This effect never fails to succeed.

The rows of turnips are scuffled in the intervals, thinned in the plants, and the land cleared of weeds in the usual way. The crop of roots will be drawn from the field for use in the homeyards, if the land be too wet, after frequent draining, to permit sheep to consume the vegetables on the ground; the land, even the very wettest clays, being gathered into ridges of twelve feet, and a drain placed in every furrow, and the ridges always kept in the same position, will, it is presumed, be placed in a condition to allow the benefit of sheep in the consumption of the crop. This privilege will be a vast acquisition; the liquid and solid excrements of the animals are mixed with the top soil in the most intimate manner, by the trampling of the narrow-pointed hoofs of the sheep, and the temperature of the ground is raised by the warmth derived from the bodies of the animals that repose for rest on the surface.

Wheat will be sown as a grain crop on clay lands, after the turnips; and, if experience shows that the tilth of the turnip crop is not deep enough for

the growth of the plant, the land may be ploughed by one furrow, and the wheat sown upon it. The drill machine will require the surface to be harrowed previous to the sowing; the broadcast way is done on the fresh furrow. But it may be supposed that the depth of tilth which has favoured the growth of the tap root of the turnip will be sufficient for the fibrous root of the wheat, which creeps along the surface, and does not descend into the ground, and that the wheat may be grown on the scarified surface of the land after the crop of turnips is removed. In that case the land would never be ploughed, but yield the products to the action of covering and scarifying. This theory is not at all beyond entertainment, but must be tested by experience; the growing of turnips is certain by the previous-mentioned method.

Clay possesses the anomalous quality of contracting by heat, and is one of the lowest conductors of caloric. To turn up with the plough, and expose to draught such a viscous and repellent earth, is exactly to defeat the intended purpose of cultivation, which is to procure some quantity of pulverization in which the seeds of plants may germinate and grow. In the present way of fallowing for wheat, the whole summer is required to yield a pulverization suitable to the seed of wheat, and which soon relapses into the original viscous mass. The operations of life are on the surface of the earth, and every living organization is the joint production of atmospheric and terrestrial elements that are constantly in contact, and whetted by an unceasing application. It may be very reasonably supposed that the uppermost layer of the surface of the ground is best adapted to the action of atmospheric agents, from having been exposed to the presence and to the use of the elements. It has been humified, aerified, and improved by cultivation, and must be much prefera-

ble to the underlying bodies, which are differently composed and repellent in nature. Hence the propriety of using only the top part of the soil for the purposes of cultivation.

The very minute pulverization of the surface soil is extended to the laying on, as top-dressing to young wheats in March, the farmyard dung which is now used on the fallows in August or September. In the early spring of the year, the land will not admit the cartage of the dung, and moveable railways of timber will be required, on which light iron waggons will convey the dung that is placed in them at the ends of the field. From the waggons, the dung can be thrown on both sides into heaps, which will cover a common ridge breadth on each side of the railway, and is, without delay, spread very evenly and regularly over the surface of the ground in the most minute fragments which hand labour can produce. Having suffered the vicissitudes of the weather in rains and droughts, the manure will be friable; and the surface being well harrowed, the winter tilth of the soil and the minute fragments of the dung will be blended into a very finely comminuted mass of mixed ingredients, which will form an excellent top-dressing to the wheat, and a bed to the seeds of grasses such as they have never yet received. The bush-harrow will cover the grass seeds, and a heavy roller closes and cements the process.

This method is founded on the principle of a minute pulverization of the earth, and of surface action on the ground. All such and similar conceptions arise from the ideas of Jethro Tull, whose genius was genuine, and seldom or never went to bed. Genl. Beaton advanced to the minute scarifying of the surface of clay lands without ploughing, and our idea extends to covering the surface, in order to mollify the harsh clay and soften the pulverization.

#### ASSYRIAN AGRICULTURE, FROM THE SCULPTURES OF NINEVEH AND THE WORKS OF AUSTEN HENRY LAYARD, ESQ.

The discoveries of Austen Henry Layard, Esq., in the ruins of Nineveh and Babylon, and his labours generally in the East, of which such favourable notice has been taken by the press, are not without interest to the agricultural reader, inasmuch as the ancient and modern agriculture of the East is depicted with a faithfulness scarcely to be met with by any other writer; while the sculptures exhumed and sent to the British Museum represent horses, camels, mules, oxen, sheep, goats, elephants, &c., &c., with a life-like simplicity which almost transports one backwards into the patriarchal days of Noah himself, to ruminate over the primi-

tive breeds of our domestic animals. When we examine the rude sculptures of Carthage, Phœnicia, Egypt, and Persopolis, of a later date, and compare them with the earliest productions of Nineveh, we are almost driven to the conclusion that the artistic perfection of the antediluvian world is exemplified in the sculptures of the latter — that Noah or some of his sons had learned to handle the sculptor's chisel in the old world, and that they had taught their offspring the art at a very early date in the new, but that subsequent to their dispersion on the confusion of language, this art degenerated in common with the others, continuing to do so, so long as



the habits of the people were pastoral, and that with the growth of cities and empires it again revived; but, be that as it may, one thing enhances the interest felt in the examination of these stupendous relics (for such many of them are), which have survived the wreck of ages—the coincidence of the facts and scenes which they portray with the oriental history of the Bible; for, according as progress is made in deciphering or mastering the cuneiform inscriptions on these sculptures, so is the scripture testimony of the sacred writers confirmed.

These sculptures are nothing less than the illustrated historical records of the kingdom of Nineveh; and although much mythological matter is introduced, yet more respect is had to the simple historical facts of the case than is met with in the annals of India and China, and other oriental states, where the truth is often so distorted as to render it impossible to be recognised. Such being the case, there cannot be a doubt but that the sculpture records of Nineveh were open to the *literati* and schools of the age; and whether they had been seen by Moses or not, it is more than probable, from the commercial intercourse between Nineveh, Babylon, and Egypt, which then existed, that his teachers were familiar with them or similar ones, so that, independent of the power of inspiration under which he wrote, he was not only learned in all the wisdom of the Egyptians, but also in that of the Assyrians and Babylonians, being master of their language and letters, as we find the Jews at a subsequent period were; and hence, humanly speaking, qualified to give that graphic description of private life found in his writings, such as of the patriarchs Abraham, Isaac, Jacob, Job, &c., &c., and accounts of public transactions such as the ransacking of cities—the slaughter of the kings by Abraham, for instance, among whom we find *Amraphel, king of Shinar*, who had carried away his nephew Lot, with the women and people of the other conquered states. "And they took all the goods of Sodom and Gomorrah, and all their victuals, and departed," we are told by the inspired penman; but Abram "brought back all the goods, and also brought again his brother Lot and his goods, and the woman also, and the people." Compare this with the capture of Ziklag by the Amalekites (1 Sam. xxx.), with the women, goods, flocks, and herds recaptured by David, and then compare both with the sculptured records of Nineveh; and how close is the coincidence of facts and systems chronicled by them!

Of the cuneiform alphabet of Nineveh few are versant; but of the scenes portrayed by the sculptures none can plead entire ignorance, who are familiar with their bibles, however involved they may be with mythological notions. At the same time, the generality have rather been taken by surprise at the artistic perfection of the works, and the life-representing faithfulness with which they are executed, although in conformity with the conventional rules of an apparently long-established and arbitrary school. The principal scenes portrayed by the sculptures are of a warlike, hunting, and national character; but, from the simplicity of the military

tactics of the times, and the comparatively uniform character of oriental life generally, an acquaintance with sacred and other history enables one to supply many a blank which a knowledge of private life and the various other branches of industry requires; and although manufacture and commerce had obviously made considerable progress at the period embraced by the sculptures, as is evident from the embroidered robes and state equipage generally, yet the wealth of the country was unquestionably its agricultural produce, for the booty of captured cities is always composed of captives, with flocks and herds, &c., as in the case of Sodom and Gomorrah above noticed; and although these captured cities were not cities of Assyria, yet the booty which they yielded became its wealth. In corroboration of this, the wealth of Job may be mentioned, which consisted of 7,000 sheep, 3,000 camels, 500 yoke of oxen, 500 she-asses, and very great household or husbandry, as it reads in the margin; so that "this man was the greatest of all the men in the east." The wealth of Bethuel and Laban, of Mesopotamia, may also be mentioned as consisting of the same. Again, in the language of Rabshekeh, the captain of the King of Assyria, at a later date, the wealth of Assyria is represented by "a land of corn and wine—a land of bread and vineyards—a land of olive oil and of honey;" and at a later period still, "Herodotus," says Mr. Layard, "alludes to the extreme fertility of Assyria, and to its rich harvests of corn, the seed producing, according to his account, two or three hundred-fold. The blades of wheat and barley grew to full four fingers in breadth; and such was the general richness of Babylonia, that it supplied the Persian King and his vast army with subsistence for four months in the year, whilst the rest of the Persian dominions furnished provisions for the other eight, and this, too, after the country was reduced to a dependency." Of the special importance attached to agriculture by the inhabitants of ancient Nineveh, and the value of its agricultural produce, there cannot, therefore, be a doubt.

The plains of the Euphrates and the Tigris with their cities were, however, pre-eminently famed as a "land of traffic and city of merchants." Both Babylon and Nineveh were trading cities at a very early period; and not only commercial, but manufacturing also—their situation between the eastern and western divisions of the human family, which had taken place consequent upon their dispersion over the face of the globe, being extremely favourable to this, more especially owing to the warlike and unsettled spirit of the age, working within fenced cities being safer than working in the open fields; and, besides this, the agriculture of Assyria and Babylon on the banks of those rivers was always experienced to be a laborious work, one the laboriousness of which was increasing rather than decreasing, owing to the sinking of the waters of both in their beds, or deepening of their channels; while, on the other hand, the increasing populations of the east and west facilitated the labours of commerce, so to speak, rendering her

profits more easily acquired. Hence, it was natural for the agriculture of both to decline, and their commerce to progress, until the latter was swamped by nautical communication *via* the Cape of Good Hope. Railway communication to the East Indies, so often mooted in this country, may restore prosperity to commerce; and steam and machinery applied to the irrigation of the soil, and the general resources of the country, may also restore agriculture and manufactures to that elevated position which they occupied when these stupendous prodigies of art—the winged bulls and lions of Nineveh—were called into existence. Art has triumphed over many difficulties in England; and it were impossible to say what obstacles may not be overcome on the plains of the Euphrates and Tigris, were the prophetic destinies of Mahomet and his devoted children finally accomplished. Until then, probability is against the prospects of progress; but, in these revolutionary times, it is difficult to say what an hour may bring forth.

These plains were subject to periodical inundations analogous to the banks of the Nile, in Egypt; but it does not appear that the same warping system of husbandry was followed, at least as the general practice of the country. On the contrary, stupendous embankments were raised, to prevent the rivers overflowing the adjacent fields; and even lakes of great area formed, into which flood waters might flow; while canals were formed for the purpose of irrigation during the scorching months of summer, a practice still followed. History informs us that the immediate successors of Nimrod and Asshur did much towards the effectual drainage of the lands on both rivers, then swampy fens, although now a scorched and parched waste in many places; and the embankments and canals necessary for such a work are doubtless those seen to this day, and noted by all travellers who have visited this interesting country. From the writings of Herodotus, quoted by Mr. Layard, it appears that under the practice of irrigation, sesame and millet had grown in former times to an incredible height, such that the historians say he dares not mention it. Millet is almost the only cereal crop figured upon the sculptures; vines and palms appear in abundance. But many of the vegetable representations are too conventional to the rules of the Assyrian school to enable one to say what they are.

The different breeds of the domesticated animals are perhaps the most interesting of the Assyrian sculptures to the English farmer; for these obviously form a link, as it were, in the history of his own live stock. It is no more than reasonable to suppose that the selection which Noah had in the ark was a good one; and the representation of the Assyrian horse, and its hybrid the mule, shows that the artist was neither ignorant of symmetry or blood, and that the breed at this period had not degenerated far from its original purity and type. The delineation of the horse—whether in or out of harness, in the war or hunting-chariot, in the saddle, or being groomed in its stall, feeding at the manger, or drinking at the watering-trough—swim-

ming a river, or scaling a hill, or charging the enemy—is faithful, and would have done justice to our Great Exhibition of 1851. The horse does not appear to have been used for agricultural purposes, or as a beast of burden to commerce. Mr. Layard suggests the idea that there may be two breeds or species of oxen represented—the buffalo, and European or straight-backed ox; but we have some difficulty in concurring with this suggestion, for the difference in the shape, or rather position, of the horn does not appear sufficient grounds for concluding that either of the two represent the buffalo, the head and horns of which are very different from those of the straight-backed and humped oxen; and the sculptors of Nineveh appear to have been more than ordinary good masters of representing the horns of all the animals sculptured, to have erred in this. With them the horn was a personal appendage. The peculiar bend of the horn forwards is always accompanied with the expression of anger, technically termed among farmers “setting,” as if to push with the horn; so that this forward bend may indicate the power of the animal, and danger to be apprehended from it. The captive ox who leads the van appears unwilling to leave its native city, and disposed to prevent the enemy, whom it may be supposed to meet, from entering, or the bent horn may symbolize even subjection. We have more difficulty in settling the question as to whether the high shoulder, or rather hump upon it immediately behind the yoke when the animal is in harness, is not intended to represent the humped or Indian ox. The body of the ox otherwise does not much resemble the Indian ox of modern times; but here this breed has so degenerated that it is difficult to say what was its original type. In the Egyptian gallery both the straight and humped-backed species are obviously figured; and there cannot be a doubt that the Assyrians, at the date of the sculptures, were familiar with both. On the other hand, art is so conventional that the high shoulder may indicate strength, and an adaptation for the yoke. There are two species of sheep—the fat-rumped or broad-tailed of the east, and our common species. There are also several kinds of goats, known by the difference of their horn. Both the single and double-bunched camel is sculptured. The elephant and rhinoceros also appear—the former subject to man, the latter mythologically—along with the sacred bull, still venerated in the east by the Brahmans, and the large Indian antelope, on the obelisk. The sea and river scenes abound with fish—crocodiles, turtles, crabs, shells, &c., &c. Of birds the vulture or eagle, ostrich and partridge, are sculptured, with other small birds not easily recognised.

The cart sculptured is a square sort of box, resting on two wheels, with a pole in front. The wheels have felts and eight spokes each, and the oxen are yoked to the pole by means of yokes on their necks or shoulders, as already stated, similar to what was common fifty years ago among ourselves, and is even still in use in the mother country and in her colonies. Alluding to the plough and such-like instruments, Mr. Layard says:

"The only representation of our agricultural implement yet found in Assyria or Babylonia is that of a plough, on a black stone, from the ruins opposite Mosul, now in the possession of the Earl of Aberdeen. It somewhat resembles that now in common use."

Of wild animals, the lion, the bull, the stag, the gazelle, ibex, and hare are sculptured. The former two are royal game, and the hunting scenes of both occupy a very prominent place, and are finely sculptured. It is said that the kings of Nineveh had parks, in which the wild bull and lion were kept for sport, but such was not their natural habitat; hence the existence of the wild bull on the plains of the Tigris at this early period becomes an interesting question in the history of our European ox, to which it obviously belonged in a domesticated state in the ark; for it is a well authenticated fact that the wild ox is not a distinct species. In the ark there were only the male and female of all unclean animals, but of clean seven; so that the different members of the bovin family, when they left it for the plains of Ararat, would form a pretty large herd—more than the immediate wants of the human family would require, along with the camels and sheep, which would also supply milk and otherwise administer to their wants. It would therefore appear that, in journeying eastwards for the plains of Shinar, Noah and his family, with their flocks and herds, kept the southern side of the hills from

whence the Tigris and its tributaries took their rise, and not the northern, from whence the tributaries of the Euphrates descended; that they had not proceeded far, when some individual bulls and cows of the straight-backed European ox separated themselves from the common herd—probably along with some individuals of this buffalo and bisontine families—and soon became wild, as they naturally would do when left to defend themselves from the attacks of beasts of prey, which doubtless hung upon their rear; and that after the dispersion from Babel, when Asshur returned backwards and founded Nineveh, they were found in the adjacent country—inviting game for royalty in those barbarous times. There is something more than the sunny side of the hills which screened the valleys of the Tigris and its tributaries from the north and north-west, in favour of the idea of the route of the primitive family from Ararat to the plains of Shinar; for the Tigris and its tributaries were much more rapid-running streams than the Euphrates and its tributaries, embracing at the same time a less area of the country. Hence the country would be more dry and healthy for both man and beast. No doubt, after descending as far as the site of Nineveh, the plains of the Tigris would be in a very marshy state; but here they had the champagne country between it and the Euphrates to spread over.

B.

## LONDON FARMER'S CLUB.

"ON THE MANY DIFFICULTIES WHICH OPPOSE THE TRANSFER OF LAND, AND THE IMPROVEMENTS THAT WOULD RESULT FROM FACILITATING THE PROCESS."

The usual monthly meeting took place on Monday, May 2, at the Club-house, Blackfriars: Mr. Trethewy in the chair. The discussion, introduced by Mr. W. Fisher Hobbs, was, "On the many difficulties which oppose the transfer of land, and the improvements that would result from facilitating the process."

The CHAIRMAN, after adverting to the arrangement announced at the last meeting, by which it was settled that the subjects of Mr. Hobbs and Mr. Ransome were to be reversed in point of time, observed that the question to be discussed that evening was one which might perhaps be viewed by some as belonging more immediately to landlords; but, for his own part, he could scarcely distinguish between what affected the interests of the landlord and what concerned those of the tenant, so entirely did they appear to him to be bound up together. He had no doubt that Mr. Hobbs would take an enlarged view of the subject, and treat it in its most important bearings.

Mr. FISHER HOBBS said: I have to address you this evening "On the many difficulties which oppose the transfer of land, and the improvements that would result from facilitating the process." It may appear, upon the

first consideration of the subject, that the transfer of land is rather a landlord's than a tenant's question. I am quite ready to allow that it is one in which the former is more particularly concerned; the interests of both, however, are so intimately associated, that any point touching on the management or disposal of lauded property can scarcely tell on the one without having some effect on the position of the other. It will be my duty to-night to endeavour to place the subject before you in such a light as I consider it becomes this club to view it. In doing this I should wish to observe, that if in discussing this question I may happen at all to direct my observations against the present position of landowners, it must be understood that I speak with no bias against the English country gentlemen, but rather on the conviction that an alteration is required which would work as much to their benefit as it would to that of their tenantry and the country at large. It appears to me that we are gradually progressing to that greater completion of a system in which, up to the present time, we, as agriculturists, have not had our share of the advantages. Day by day, step by step, from one government to another, and from one Chancellor of the Exche-

quer to his successor, do we learn that the principles of free trade are those which are to direct us. If, then, we must have free trade, let us have it fully carried out, and not the one-sided system it is at present. It seems only consistent that if we are to have free trade in the produce, we should have it in the land itself. To the farmer the land is simply the raw material; and it is only common justice that he should be able to procure it on the easiest and most advantageous terms. This can never be accomplished without a strong demonstration on the part of the agricultural body. On this very night, and perhaps at this very hour, the Legislature is passing a measure which can scarcely fail to have a prejudicial effect, and be a further tax upon landed property (Hear, hear). In other countries, such as France, Belgium, and Prussia, land is almost as marketable a commodity as stock in the funds; its disposal is simple and economical; with us, on the other hand, we are told it takes occasionally months, or even years, to effect a transfer on. In an excellent pamphlet, addressed by Mr. Sewell, a respectable solicitor, to Lord Worsley, now the Earl of Yarborough, "On the Burdens of Land," in 1846, I find these words:—

"Every material transaction must be proved, at however remote a date, and however difficult to trace. The compliance with all the requisites of an over-scrupulous purchaser frequently occupies a very long time. I have known, not months or weeks, but years consumed in the inquiry. For what amount of evidence may be accepted of particular facts, as of the deaths of parties, the discharge of debts and incumbrances, and the like, is altogether a question of discretion."

The question that naturally arises here is, How is this? Plainly, then, it must be admitted that these difficulties are but some further remains of that feudal system under which this country was once placed—when, in fact, the chief care was to make land *not* a marketable commodity. It must be confessed that since that period, what with the law of entail, and the many settlements made upon a property, we have done everything to further the views entertained at that early age, and so gradually arrived at the most efficient means for preventing anything like facility of transfer: these are found in the elaborate and complicated titles with which estates are now saddled. Mr. Stewart, the eminent barrister, who is well known as a good authority, aptly enough designates this as "the root of the evil;" and I cannot do better than give you his account of the abstract of title which it is necessary to make on the transfer of landed property:—

"How unwise then is this policy, unwise to all, depreciating the value of land in the hands of those who own it, and excluding the great body of purchasers from the market. That this is practically the present state of the case I shall now proceed to prove. And here I must enter a little more into detail. It is impossible to prescribe the proper remedy until we know the exact nature of the disease. I wish, therefore, to trace the history of a sale of land, and to see what is the cause, as now conducted, of the expense, the delay, and the insecurity which at present attend it. I shall go then at once to what I consider the root of the evil and give you some account of what

is called the *abstract of title*, of which most of you have heard. And here you must again carefully distinguish between the theory and the practice of the law in this respect. Nothing, by the theory of our law, is more rapid, more instantaneous, than the passing of land from one person to another. If I, being the owner of land, write the following words, 'I grant, in consideration of £ , all my land in such a parish and county, to John Thomas and his heirs,' and this is sealed and given to John Thomas, it is a perfect conveyance of the fee simple; and if properly stamped as a deed, it is evidence to all the world, and if it was not sealed it would be enforced against the seller in a court of Equity. But the practice of the law will not allow these simple transactions. It says—'No! before I can sell to John Thomas, either by private contract or by public auction, I must deliver him what is called an abstract of title. Now what is this? An abstract of title is an abbreviated account of the deeds, wills, and other documents in the possession of the seller. The importance of this document is exceedingly great to both parties, *i. e.* to seller and buyer; it discovers, if properly drawn, the exact state of the title; if flaws exist, it must therefore discover these. On the other hand, the purchaser has thus notice of them, and if he does not discover them in time, on his h must rest the consequences."

This puts us, more perhaps than any other transaction, in the hands of *lawyers*. If now you do sell or buy, you trust simply to their word, and are in fact entirely at their mercy. They examine the deeds, which are frequently ponderous, and of course prepare copies. Then, perhaps, an omission or mistake is made. And when we come to consider the mass of words employed, the only wonder is there are not more. Then, I say, some blunder of a lawyer's clerk may lead us into a Chancery-suit as long and as expensive—provided only the estate will afford it—as that which followed the fortunes of Bleak House and the Jaundyces. I said just now that deeds are frequently ponderous. To show that I do not make this statement without foundation, I beg to read the following extract from a private letter:—

"As an instance of the length and expense of conveyances being occasioned by family settlements, I may mention that Mr. — and myself having purchased, last year, a small estate at —, part of the settled estates of the — family, our conveyance exceeds three-hundred folios in length; and you may naturally suppose that we should not have a longer conveyance than we could help, the expense coming out of our own pockets. On the other hand, I have made a conveyance of land at — for a sovereign, stamp included."

Any gentleman in the room, who was at all acquainted with conveyancing, need not be informed how heavy was the charge for three-hundred folios. (Hear, hear.) I am speaking here, gentlemen, as you may suppose, not altogether on my own authority, or (as I am happy to say) on my own experience. Mr. Stewart, in his excellent work "On the Difficulties and Dangers now attending the Transfer of Land," says:—

"Now one word here: I am entering somewhat into the mysteries of the art, although I am telling you very little that you may not find elsewhere in print. I need not say that neither on the present occasion nor on any other occasion have I wished to throw the slightest imputation on any branch of the profession of the law: it is the system only, of which I com-

plain; nay, if I had any doubt of the honesty and integrity of the profession of the law, and more especially of the attorneys and solicitors, it would be removed when I find in my own knowledge so very few instances exist of the abuse of the great powers of acting improperly with respect to the preparation of these abstracts. For look how extensive these powers are. In the first place, there may obviously be suppression of deeds. The Real Property Commissioners, as I have already mentioned, show the numerous opportunities which exist for this suppression, observing that a person who has entered into a contract of purchase is compellable to fulfil his contract, unless he can object to the title shown; the possible existence of documents unproduced not being a ground of defence. Now then we have, in this respect, three fertile sources of danger and insecurity let in upon every abstract—accident, mistake, and fraud; accident may mislay, mistake may blunder, fraud may suppress. But we will pass this over, and let us suppose that none of these causes interfering, there is an intention of giving on the face of the abstract all the deeds and documents relating to the title. These documents are abstracted on the one hand, and are compared with the original documents by the solicitor of the purchaser on the other. I need not tell you how important a duty this is, how necessary it is that the persons who perform it should not only be careful and honest, but competent to do this duty efficiently. The omission of three words, the addition of three words in a certain part of a deed, may alter entirely the position of the parties in Westminster Hall, and determine whether their remedy be in a court of law or in a court of equity. The omission or alteration of *one word* may be of most material consequence in the construction of an intricate deed or will."

I think this is in itself enough to call for some reform. I am only surprised that matters have been suffered to remain so long in the state they are; and can but account for it by supposing that few of us know the risks we run, or the dangers that follow us, when we make that most curious of all bargains—a purchase of landed property. We are promised that law proceedings—those of the Court of Chancery more especially—shall be simplified and shortened, and suits there no longer remain the same abuses they have been. It does appear to me, however, that to accomplish this reform you must necessarily take some similar steps in regard to the transfer of landed property. Could a man clearly understand his own rights, not half those actions would ever be brought; and the funds now wasted in this or that court be beneficially employed in the improvement of that soil from which they are chiefly derived. If you are going to shorten and simplify suits arising out of the ownership of land, you must in the first place, I should say, simplify and shorten the titles on which such lands are held. Here, in simplifying titles, I expect is the grand difficulty, but surely not an invincible one. From what I can gather, by making myself acquainted with the best authorities on the subject, many of our best lawyers themselves consider such a plan as a short simple title not only desirable but practicable. I may quote here a letter to the Lord High Chancellor of England from a conveyancing barrister, entitled "Shall we Simplify our Titles?"—

"There must be something unsound in the law when persons of ordinary intellect and education cannot be made to

understand it. I think I may assume the following to be indisputable facts; and at all events their truth will be made abundantly evident in the course of this letter:—1st. That the complication of titles is the chief cause both of insecurity and expense in the transfer of land. 2dly. That the most obvious mode of lessening this evil is, by narrowing as much as possible the inquiries which it is necessary to make before purchasing estates; and 3rdly. That this complication arises mainly from the power possessed by landowners in this country of settling their estates on their families, and, for that purpose, of creating partial interests therein."

They admit the necessity while they advise the remedy, which might be by registration courts, with index and maps, to which the Tithe Commission would materially assist. In fact, I may say that the subject of a map suited for that purpose is at the present time under the consideration of the Government. I cannot do better here than offer to your notice the opinion of Mr. Stewart as to the establishment of some such court as I have referred to, as well as the support his recommendation receives in a pamphlet lately published, "On Law Reform and the Transfer of Land," by a Right Honourable—I can only regret that the author gives us no further clue to his identity. Mr. Stewart says—

"I propose the establishment of a register of all the lands in this country, which is to be divided into districts for this purpose, of a smaller or greater extent as may be thought most advisable. My own idea is, that these districts should follow pretty much the boundaries of the districts of the county courts, and that the officers of those courts, as well as the present registrars of births, should to some extent be available for carrying on the functions of the register. I would establish a register in each of these districts, but I do not propose that it should be compulsory on any owner of property to register his land until some transaction respecting it took place. I would accompany the establishment of the register by the taking of an accurate map of the whole lands in every district, which should be identified in all its particulars by numbers, but which, as to boundaries or ownership, should not be evidence until acted on, and when acted on be only evidence against the person who so acted on it, but not as against any one else."

And the anonymous Right Honourable—

"A public office or department should accordingly be established, which might be called the Land Transfer Office; and every future transfer of land, in order to be valid and effectual, should be made in such office. Books should be kept in the office, with a printed form of transfer on each page. The form of transfer should not be longer than the form of transfer of Government stock in the books kept at the Bank of England. No trust whatever should appear on such transfer.

"A map should accompany every transfer, and such map, for the purpose of identification, should be signed and witnessed at the same time as the transfer, and the transfer should refer to such map. The map should be either annexed to the page opposite the transfer, or, if more convenient, all the maps might be bound up in a volume, to correspond by an outward number, or letter, with the volume in which the transfers were made. The trace of the land conveyed should be made on a copy of the Ordnance survey map in those counties in which the survey has been completed; and as the accuracy of these maps would be a matter of general importance, it would be proper that they should, in all cases, be traced or made

by surveyors who should be officers of the Land Transfer Office, and who should be appointed for certain districts."

Hitherto, we have rather referred to freeholds, but many other kinds of property are equally embarrassed and complicated; as, for instance, copyholds, leaseholds, church lands, leases for lives, &c. With respect to copyhold, my views have been so recently expressed in the discussion I opened here on this subject, that it will be quite unnecessary for me to go into any detail upon it. I think it right, however, to say that the act to facilitate the Enfranchisement of Copyholds, which was reluctantly brought forward by Earl St. Leonards, and passed during the last Session, if not altogether inoperative, will do but little to effect this object. (Hear, hear). Touching leaseholds, church lands, &c., I find the following evidence given by Mr. John Houghton, before the Committee on Agricultural Customs:—

"If you understand the legal part of the question, you will see that that [the power of carrying over a contract] would enable a person to bind his successor, a power which the law does not give him? Yes, exactly; and, as I have said, a great deal of good would be done in this country if a measure of that description could be passed. I know, and I find it from experience, that landowners have regretted that they have not had the power; they have said, 'I have only a life interest in this property, and I have no money; I should be glad to do something if I could for you, but I cannot; therefore the Legislature should step in to give the tenant the power of carrying these improvements out. I had a case the other day; it was that of an old lady of seventy-five: the case is exactly similar to the one I have mentioned. The tenant said, 'I have no power whatever to do anything; as soon as the breath has gone out of the old lady, the property goes into an entirely different channel; I cannot do it, and she will not do it; I cannot lie dry in my bed.' And as to the rest of his premises also, they were in a state of dilapidation; they were actually tumbling down. Those are instances where I think the plan that I have suggested would work, and it is the same with the buildings. I very frequently go into a district, and I see that the buildings are all in a state of dilapidation. I had a case the other day: I was looking over the estate of an old lady, who has died since, at the age of eighty-eight; and as to the buildings, I never saw such a scene. The tenant said, 'We cannot do anything, and she will not;' and the thing went on until it was a sort of wreck altogether. Supposing this power had been sanctioned by the Legislature, all parties would have consented to do what was requisite; no one would have objected; the tenant would have given the notice, and the old lady would not have raised any objection to it, and the tribunal would have seen it was a beneficial outlay; they would merely have signed this notice to say it should have been done. I have thought, as I have said, that the Board of Guardians would be a very good tribunal for the district.

"It being in evidence before this Committee, by a barrister, that he could not do so without the consent of the mortgagee, are you prepared to give an opinion adverse to that legal opinion? I should say that it would depend very much upon what the terms of that mortgage were; if the mortgagee had the power of entering into possession, and if he should not enter into any agreement, he could not do it."

Mr. Ramsay's examination, again, is as follows:—

"Does any difficulty occur in your knowledge in the counties of Durham or Northumberland from parties not having the

fee simple of the land being unable to give leases to tenants? Yes, many cases.

"Would it be an advantage to the country generally that persons upon such disability should be able to secure the tenant at the end of the term? Yes, it would be an advantage to the landlord in possession, and also an advantage to the landlord that succeeded.

"And also to the tenant? Yes, and to the tenant also; it would ensure that land to be as well farmed under such regulation as property where there was a full power to grant a lease; tenant-right would apply particularly to that.

"Then would it be an advantage that power should be given to parties having limited interest in land to do that under certain regulations, the same as if they had the fee simple? That is self-evident."

I am afraid it unfortunately does so happen, that we have many, I think I may venture to say, a large proportion of landed estates in the kingdom in this encumbered position, with neither the means to effect their own improvements, nor to secure others who may be willing to do them. In Messrs. Shaw and Corbet's "Digest of the Evidence on Agricultural Customs," I find the Committee thus stating their opinion with regard to the Law of Entail:—

"That it seems very desirable to your Committee that estates under settlement should be endowed with every practicable privilege for their advantage which is attached to absolute property; and that persons having limited estates, in addition to the ordinary leasing powers generally conferred on them, should be enabled, under proper precautions, to enter into stipulations of the nature of those above referred to, which at present it appears they cannot do.

"That the power to enter into such stipulations, binding on subsequent interests, might be advantageously made a general incident to leasing powers of land in settlement, by the aid of Parliament; and also be conferred on persons having certain limited interests in land."

And the evidence adduced fully warrants them in this. Mr. Stewart, whom I have already quoted is a high authority on all matters relating to the tenure of land, says, I find, in page 166 of the same work (Digest of Customs)—

"Are there any landowners, or persons standing in the relation of landowners, who are by law incapacitated from binding themselves and successors to remunerate their tenants at the termination of their tenancy for temporary, durable, or permanent improvements? I should say a large class indeed.

"Supposing he sells the estate, can the tenant recover? I do not think he could: the question is this, supposing a person enters into a contract, as being seised in fee-simple, with a tenant, that he would be responsible for the improvements, and then he sells the estate, how far would that obligation affect the fee-simple that he sells? I conceive that it would not affect it, unless there was some agreement, or some understanding; if the tenant had this agreement endorsed on the title-deeds, or in such way that notice could be given of it, there might be some question raised there.

"In the case of a landlord selling an estate, having entered into an agreement with the tenant for improvements, and the landlord becoming insolvent, would the tenant have any power of recovery against the estate of the landlord? The case I understand to be this: a person being seised in fee-simple enters into a contract with a tenant for the restitution of im-

improvements, and he subsequently sells the estate, and becomes insolvent; there is no notice to the purchaser of this contract at all; of course the purchaser takes the estate free from the obligation, and the tenant has no remedy except so far as the assets of the vendor are concerned.

"In fact, no man can bind his estate beyond his interest in it? No.

"And if he attempts to bind it beyond his interest in it that contract fails, and custom takes the character of the law? Yes."

Mr. Caird, the *Times* Commissioner, appears to have been equally struck with the necessity for some alteration, for he makes the easier transfer of land the first and greatest recommendation in his much discussed letter of January last, as inserted in the *Farmer's Magazine* for February. With your permission, I will quote from him:

"The suggestions with which my letters closed in 1851, and which the experience of another year has greatly strengthened, are these:—Facilitate the transfer of land; render it more easily available as a fund of credit: give a partial power of sale, under sufficient safeguards, to the owners of settled estates; encourage leases with liberal covenants; alter the law of settlement, and extend the labourers' opportunities of receiving education; and collect agricultural statistics.

"To most of these measures Parliament has now given its sanction, for Ireland. The entire prostration of that country was needed to convince the Legislature of the impolicy of perpetuating encumbered property in the hands of owners who had all the responsibilities of that position without the means of discharging them. The same necessity has not arisen in this country, but in many quarters it is more imminent than is supposed. Nor are just and beneficial measures to be postponed merely because injurious practices which exist have not yet become ruinous. The frustration of land improvement in a country with limited surface is a positive evil which it concerns the Legislature to remove.

"Since the report by the committee of the Lords in 1846, the most important recommendation of which was 'the improvement of the law of real property, the simplification of titles and of the forms of conveyance, and the establishment of some effective system for the registration of deeds,' repeated attempts have been made to facilitate the transfer of land. The expenses, including stamps, upon a sale of £50 value were proved before that committee to amount to 30 per cent., upon a sale of £100 value to 15 per cent., upon a sale of £600 value to 7½ per cent., and upon £1,500 to 5 per cent. The difficulty and expense of raising money on landed security, and of transferring the mortgage, are also very great, and both circumstances are found seriously to diminish the marketable value of real property, and to hinder it from becoming a favourite subject for investment, except for men of large fortune. It would be a waste of space to dilate on the public and private disadvantages thus occasioned, for they are acknowledged by all who have studied the subject, and seriously felt by those who are affected by it. But, besides this, much of the land of England—a far greater proportion of it than is generally believed—is in the possession of tenants for life so heavily burdened with settlement encumbrances, that they have not the means of improving the land which they are obliged to hold."

Is it a matter of any wonder, then, that in such a state of circumstances we find land undrained, or at the best partially or imperfectly drained?—buildings equally inefficient?—the very foundation of agricultural improve-

ment so woefully neglected? And yet, on the other hand, consider the amount of money that would be rapidly poured in on us for such employment, were there only some easier channel for it to flow in. I might extend these observations to a much greater length; I think, however, I have said sufficient to show the general injury which all classes suffer, more or less, from the lamentable manner in which much of the land of this kingdom is hampered and charged—(cheers)—consequently fettering landlords from granting conditions to their tenants, which might not only be an advantage to both, but also a national benefit. As for the farmer, the first considerations for him should be liberty of action, as well as a confidence in the landlord he holds under: he can enjoy neither of these to anything like that extent he should, under such a system as that I have endeavoured to pourtray to you. Encouragement and assistance can be little expected from any man, himself in a comparatively powerless position. It may be said that this position is more or less a necessity. The principle upon which the Government of this country is conducted may of itself demand that certain property should be insured to those who from their rank take a prominent share in that Government. I should regret to utter one word that might be supposed to tell against such, for I really believe the reform contemplated would tend as much to their advantage as it would to that of other branches of the State. I have now, gentlemen, endeavoured, to the best of my ability, to bring this important subject before the members of the London Farmers' Club. In doing so, you must know that I have had no professional experience, but offer these observations in my own position as an owner and occupier of land. It is a question, I am aware, that is beset with many difficulties; but the more I have studied it the more I am convinced that much may be done to facilitate the transfer of land without in any way interfering with the *just rights* of property, or at all endangering that form of Government under which we have so long continued. In conclusion I shall, in accordance with a plan I have hitherto pursued at these discussions, when I have had the honour of introducing a subject, offer the following resolutions for your consideration; either to adopt, improve, or reject, as you may think best:—

1. That the difficulties attending the transfer of land have generally become so many and embarrassing as to demand the serious attention of the legislature, with a view to removing them.

2. That the effect of these difficulties is in the highest degree injurious:—to the *owners* of the land, who, encumbered with them, can seldom make the most of their property; to the *cultivators* of it, who are thus too often denied that aid and encouragement in the way of permanent improvements—such as buildings and draining—that should properly come from the landlord; and to the *public* at large, who are consequently deprived of those opportunities for investment, and the advantages of increased production, they would otherwise enjoy.

3. That the first and most direct means for removing these difficulties would be the improvement of the law of real property, the simplification of titles and forms of conveyance, together with the establishment of some effective system for the registration of deeds (cheers).

Mr. ACTON said, he had long thought that, as agriculture progressed, inroads must be made on the laws relating to real property. Notwithstanding the reports, however, which had been issued by various committees, it was remarkable that nothing had yet been done towards either the simplification of titles or the establishment of agricultural statistics. (Hear, hear.) They had the authority of the present Chancellor of the Exchequer for saying that the measure upon which so much stress had been laid would not shorten conveyances by a single line. (Hear, hear.) As the law stood, it was still necessary to go back for the last twenty years, and to state the whole of the incidents which had arisen during that period; and in some instances, so bulky did the abstracts become, that a hackney coach would scarcely contain them (laughter). It should, however, be stated in justice, that the fault did not rest entirely with the lawyers: this state of things generally arose from prudence in one party and imprudence in another. Hence was it that, in the language of a conveyancer, in whose office he had spent a portion of his life, it was necessary to tell the whole family story in the deeds. In any alteration which might be made care must be taken to maintain inviolate the rights of property. No one, however, could peruse Shaw and Corbet's "Digest of Agricultural Customs," which was a very good epitome of the whole subject, without coming to the conclusion that the tenant for life should have more power than he possessed at present. The freeholder could already do whatever was necessary for his own interest and that of his tenants, but the power of the tenant for life was most injuriously restricted, and his position called for legislative interference.

Mr. PYLE, President of the Winchester Farmers' Club, said the great obstacle to the registration of deeds appeared to be, that landed proprietors did not wish to have it known to what extent their estates were mortgaged (Hear, hear). Although he perfectly agreed with all that Mr. Hobbs had said on the subject, yet he contended, as he had always done, that justice must be done to landowners before they could be expected to do all that was required for the benefit of occupiers. Now he maintained that all land should be placed in such a position that the capabilities of the soil could be fully developed—(Hear, hear)—without injury to the proprietors, the cost of permanent improvements being charged upon entailed estates. All life and copyhold, and renewable leaseholds, should, in his opinion, be enfranchised by a fixed annual payment, charged upon such estates, estimated in accordance with the average of receipts for the last seven years—similar to the commutations in lieu of tithes. This system would give the lessees security to improve to any extent they pleased,

and they then could safely grant their tenants compensation at the time of quitting. It would also enable the tenant-farmers to vote conscientiously, and without the fear of sustaining any loss, by receiving six months' notice to quit (Hear, hear). He could not agree with Mr. Hobbs, that there should be a local registration court (Hear, hear). No man would like all his neighbours to have the opportunity of becoming acquainted with his exact position; although it was generally pretty well known in every locality whether a particular estate was mortgaged or not (laughter). He thought the discussion introduced by Mr. Hobbs must have a beneficial tendency, and saw no reason why a system of registration should not be established which would render the transfer of lands as easy as that of money in the funds (Hear, hear).

Mr. NESBIT said, looking at the subject, not as a lawyer, but with the eye of common sense, it certainly appeared to him that there could be no serious difficulty in effecting a vast improvement in the whole system of transfer (Hear, hear). A man who had £10,000 might invest it in the Funds, have his name properly enrolled at the Bank of England, receive the dividends, and ultimately transfer his interest without the slightest obstruction (Hear, hear); nor, he apprehended, was there any difficulty in raising money on such securities to the extent of their value, even though they should form the subject of a marriage settlement. Now, if such were the case with regard to the funds, why should there not be a national system of registration for land? and why should there not be written across the back of the deed any debts which might have been incurred by the possessor (Hear, hear)? He was now speaking with reference to the principles of common sense, and setting aside, as it were, previous legislation and feudal relics. No doubt the matter was surrounded with difficulties, but they were not to be turned aside from a desirable object on that ground (cheers). It was evident that obstacles to the transfer of landed property must proportionately diminish its value, and therefore lessen the amount of rent which it would pay ("No, no"). The fewer charges there were on any property, the lower, evidently, must be its value (Hear, hear). Looking at the subject generally, he thought it most desirable that common sense should be consulted, with a view to an alteration which would render the transfer of land easier and less expensive. The question was a most important one, and there could be no doubt that the object would soon be accomplished, if they could but get rid of the lawyers (laughter).

Mr. SIDNEY said the first point to be settled in such a discussion was whether or not there was a grievance, and that he thought had already been decided in the affirmative. The operation of the present system was most injurious to agriculture. He had himself known instances in which a farm had been let to a tenant at a reduced rent in consideration of his taking it in bad condition. What was that but a premium on bad



farming (Hear, hear)? Another result of the system was that it had actually led to the formation of a society for manufacturing titles (Cries of "Oh"). He could assure them that he was stating a fact. There was a company in existence which, by means of an arrangement with the owner, would take possession of an estate, and after clearing the title of all difficulties and obstructions, offer it for sale in its new character. If such a power could be exercised in the case of one particular estate, why should not similar facilities be extended to all the estates in the kingdom (Hear, hear)? Such was the present state of things that sixty per cent., he believed, of the estates of this country were what lawyers termed "good to hold but bad to sell." One great source of mischief was, that many families tried to hold more land than they could conveniently (Hear, hear); and he believed many of the noblest families in the kingdom were eaten up by the pride of appearing what they were not. The remedy for this evil was to abolish secrecy with regard to titles. They had no right to blame the lawyers in this matter. Were the doctors allowed to give them all manner of diseases in order that they might afterwards cure them, they could not reasonably expect to be very healthy (laughter). They must make up their minds either to abandon secrecy with respect to landed property, so that any one who took the trouble might know the exact position in which it stood, or to have something of a struggle with that body who had a vested interest in the present expensive system. It was not for the Club to point out a remedy; it was their business first to convince themselves of the grievance, and then to press it forward in such a manner as to compel the legislature to pass some measure to remedy it. No time was more propitious than the present; the agricultural interest were now in a position to be listened to; and as this was a grievance which affected every part of the community except lawyers, he believed that if they all pulled together they would succeed in effecting some good. He would conclude by saying, he did not think anything could better promote and sustain the spirit by which agriculturists should be animated than the taking up such general subjects as the one under discussion.

Mr. SHEARER mentioned that, in his neighbourhood, an enclosure was being made, the valuer of which, who had authority to sell portions to pay expenses, could give a title; by which he sold the land as absolute freehold on an ordinary sheet of letter paper; the legislature (he believed) not even requiring the document to be stamped; while other parties, who had a right over the enclosure, not only had their allotments made to them as copyhold inheritance land, but had it subdivided into as many portions as there were quit-rents to pay, which of course occasioned a great deal of trouble and expense.

Mr. RAMSEY could only wish that the simplicity with which his friend, Mr. Nesbit, would manage the transfer of land was as practicable as it was desirable. He, however, as well as the gentleman

who had thought proper to introduce it, had admitted that it was surrounded by almost insurmountable difficulties; that the law was so complex and diversified in its operations, and the transfer of land burdened in so many ways, that he did not know how to get rid of them. He (Mr. Ramsey) did not find fault with lawyers for making what they could out of these matters; for it was a fact that farmers and everyone else did the best they could for themselves (laughter). Nothing could be more desirable than the proposals of Mr. Hobbs; but there were certain encumbrances about them, certain rules and regulations to go through in carrying them out, because there must be security. Now, people were apt to think a title containing but few words, of no value. This feeling was so engrafted into men's minds that it indeed required all the attention that could possibly be given to it; still, when he recollected the many difficult things which had been accomplished, he did not despair of any efforts in that direction being successful (Hear, hear). It was well known that some titles could be got in a very simple way; but there were others which would always be encumbered. The registration of deeds was a subject which had been very much thought of in this country. In Scotland there was a registration-office where any one might see a deed for a shilling, though he believed the plan did not work quite so well there as had been expected. He thought they were highly indebted to Mr. Hobbs for bringing forward the subject of the evening, and believed the Club had risen in their estimation from their seeing a subject of so much importance brought forward by one of their best members (Hear, hear). It was a great thing that there was a man amongst them with sufficient courage to broach such a subject; five or six years ago it could not have been done (Hear, hear). He wished to see the Farmers' Club much extended; he did not approve of farmers calling out to governments and landlords to help them in their misery. He wanted no help, and hoped the other members did not require any; but they wanted "the sinews of war"—(laughter)—they wanted extension. Let the landlords come and join them, for surely they could not be afraid of the truth; and let the members of the Club be trebled in number (Hear, hear). He considered that the time was come when they must give up some of their trifling arguments, and stand by their guns; and depend upon it if they fired them right they would have a good effect (laughter).

Mr. BAKER thought there were some points in the question that had not been touched. He always viewed it as a landlords' question, to a very great extent; but still there were points in it which very much affected the tenant. One was, that owing to the difficulty in the transfer of land, there was just as much expense in transferring the minutest portion of the estate as in transferring the whole of it, except the cost of the stamps. If that was not the case, we should not see one man's field lying opposite another man's homestead. If there was a ready and easy mode of exchanging or transferring land, all this might be remedied; and he

believed a quarter of the cost of cultivation would thus be saved (Hear, hear). It was not uncommon to see his neighbour carting his manure two miles beyond his farm; while he (Mr. Baker) had to carry his as far past his neighbour's in another direction. The present system of carrying out the copyhold also very much affected the tenure of land—and this in various ways. Thus, in the case of waste land, which could not be obtained without very great difficulty and expense. He now wanted to enclose a portion for fencing, but the cost of doing so would be four times as much as the land is worth; and because he could not use waste soil for manuring purposes without great expense, he was obliged to cart lime from a long distance. There was in his district a powerful lord of the manor, and a powerful court, and they granted away the land, taking the lion's share for themselves, and giving the copyholders a very mean proportion. So that the land was all passing from the persons entitled to the herbage, whilst there was not one man who had the courage to hold up a finger against it, or to enter a lawsuit against the lord of the manor (Hear, hear). By reason of these strips of land not being easily conveyed, the labourers were driven to villages and towns, where they ought not to be for the advantage of the farmer. If small pieces of land could be obtained in the places most convenient for labourers' cottages, it would be a most considerable advantage; but now the transfer would cost more than the cottages themselves; consequently, the labourers were compelled to live in places where they had to walk two or three miles, morning and evening, to their work. These were some of the advantages which would result from an alteration of the present system. He thought the Club was now in a position to draw attention to their proceedings: in fact, alterations which had first been agitated within those walls had become in some instances beneficial law, and in others were tending rapidly in that direction.

Mr. BENNETT adverted to the great difference between the value of copyholds even in the same counties, and said he was convinced that the subject was of as much importance to landlords as to tenants.

Mr. HOBBS, in replying, said it was most gratifying to find that the paper he had read had met with so much approbation. He could only say that it would give him greater encouragement on future occasions to render his humble aid in support of the club. He had not treated at any length the subject of copyholds, although it was a great grievance, having within the last twelve months gone into the subject

fully. The united feeling which had been expressed that evening gave him an assurance that the matter would not rest there. Something more would be done he had no doubt—if not by that club, yet by another body, who watched their discussions and opinions perhaps more closely than they were aware (Hear, hear). Mr. Acton had mentioned a bill which had lately been brought into the House of Commons by Mr. Drummond and Mr. Headlam. He had that bill, "to facilitate the sale and purchase of land," in his hand, and he was happy to say it coincided with his views. He (Mr. Hobbs) had in his possession the report of the Committee on agricultural burdens which sat in the House of Lords in the year 1846. That committee consisted of the most influential landed proprietors and law lords in the kingdom; and it was a most extraordinary thing that this committee, contrary to its other proceedings, were all agreed respecting the transfer of land. It might not be out of place if he read to the meeting their remarks: "The committee earnestly request the attention of the house to the important evidence of Mr. Stewart on the evidence proceeding from the length of deeds connected with real property; and while the committee acknowledge the benefit of the act passed last session, they are anxious to impress on the house the necessity of a thorough revision of the whole subject of conveyancing, and a disuse of the present prolix, expensive, and vexatious system. The committee have received evidence on the advantages of a registration of deeds in Scotland and Ireland, and on the great facilities afforded by means of a similar method of dealing with real property in foreign states. The committee, however, limit themselves to the expression of their opinion, that a registry of title to all real property is essential to the success of any attempt to simplify the system of conveyancing. \* \* \* \* In conclusion, we recapitulate some of these recommendations: first that the improvement of the law of real property, the simplification of titles and of the forms of conveyance, and the establishment of some effective system for the registration of deeds. He (Mr. Hobbs) could only say that he hoped that would be the commencement of better times for the Farmers' Club. There seemed a good feeling manifested to cooperate and pull together for the future (Hear, hear). Mr. Hobbs concluded by reading the resolutions.

The resolutions were moved by Mr. Cheffins, seconded by Mr. Ramsey, and carried unanimously.

A vote of thanks to Mr. Hobbs and the Chairman having been passed, the proceedings terminated.

## O N L I M E .

Many have been the controversies on the subject of lime. It has been gravely argued whether it acts mechanically only, or chemically, or whether it combines both; whether it has any actual specific action on plants themselves, or whether it merely

renders the soil in some way or other better calculated to produce a crop. On all hands, it seems however to be admitted that it is demonstrated to be beneficial on all kinds of land, those long worn out with cropping, as well as newly taken out of grass

or of moor; and it is generally now allowed that even on limestone soils a dressing of the land with fresh burnt lime may be of the greatest advantage. Hence it appears as if there was some material in fresh lime which was absent in that which is effete; and this has caused a series of minute inquiries to be made, which have opened out a great variety of curious facts connected with the application of that peculiar substance.

It may be observed, when speaking of limestones, that those which were always considered the purest were those that had the largest amount of carbonate of lime. Those nearest purity were admitted to be agriculturally the best; while those impure, oolitic limestones, containing as much as from 20 to 30 per cent. of sand or magnesia, had necessarily a lower agricultural value. Now as regards sand and magnesia, there is perhaps no doubt but the estimate was right; but with some classes of limestone the greatest amount of impurity may nevertheless constitute the value of the lime.

The mountain limestone, for instance, contains organic remains, in considerable quantities, and hence, as may be expected, has a greater or smaller per-centage of phosphoric acid; while the amount of sandy, or waste matter indeed of any kind, is very inconsiderable. The miscellaneous impurities of limestone were generally classed by three or four together. We have several analyses now before us, and they run, oxides of iron and manganese—or sulphuric acid and common salt—but all perhaps less in quantity than one per cent. when added together. Professor Johnston showed by analysis that the Brampton limestone contained about one-third per cent. of phosphate of lime, and in pursuing his researches further, discovered that the Carluke limestone contained as much phosphate of lime as from 1.14 to 1.48 per cent.; one and a-half per cent. being in the most favourable specimens; a large amount of bone-earth—equivalent, in fact, in a dressing of four tons per acre, to some thirty pounds of bone-earth, or upwards of two stones per acre—as much as is often drilled in the shape of superphosphate for the turnip crop.

But it is not this alone, but other substances which recent discoveries show to be equally useful to the soil, and equally necessary to crops, that are found in our impure limestones. They were found by Professor Johnston to contain not only traces (as they had before been described) of sulphuric acid, but considerable per-centages.

The Cokermonth lime contained 0.22 per cent. of sulphuric acid, or equivalent to 0.38 per cent. of burnt gypsum. The Brampton lime contained 0.30. per cent of sulphuric acid, or equivalent to 0.51 per cent. of gypsum; and the Kilnhead

contained exactly the same quantity; while the Carluke lime contained 0.85 per cent., or equivalent to 1.45 per cent. of burnt gypsum. A dressing therefore of 4 or 5 tons will give an application of gypsum equal to 45 to say 55lbs. per acre. Other limestones seem to contain the same material in hitherto unsuspected quantities. It occurred in the Silurian limestones, in quantities varying from 0.37 to 0.41 per cent.; in the carboniferous, from 0.62 to 1.08 per cent.; and even in the magnesian, from 0.39 to 0.50 per cent.

Yet recent discoveries open out the value of silicate of lime in a new light. Is all the silica in the lime real impurity after all? May it not be a part, and a very important component, of its value? Professor Johnston seems almost to have shadowed in outline the idea subsequently more fully developed; for he speaks, in his work on lime, p. 250, of a gelatinous silicate of lime; and there gives the absolute quantities of the material in the three limestones to be—in the

Cokermonth....	4.92	per cent.
Brampton.....	2.16	„
Kilnhead.....	3.39	„

Now must we suppose the caustic magnesia to be always injurious? There are doubtless states of the soil, when it may be of the greatest advantage. In cases where the turnips are subject to the disease called “fingers-and-toes,” it is known, especially in combination with salt, to be highly serviceable in forming a partial at least, if not a total antidote to the disease, be it produced from what it may; while in peat soils, it may be applied with impunity in very large quantities.

To peat, indeed, it is often advantageous not only to apply the more caustic lime—the magnesian, but to apply it in the hydrate state, and before the slow action of the atmosphere on this variety of lime has produced its carbonising influence.

Lampadius showed how quickly lime would disappear from a soil. Saturated until it held 1.19 per cent. of its whole bulk, which soil had year after year given the following results:

The second year it contained only	0.89	per cent.
The third.....	0.52	„
The fourth.....	0.24	„

So rapidly does lime disappear, washing downwards, as most farmers think, by the action of the plough and of water; but carried off, no doubt, as extensively in the crops we cultivate. In conclusion, for all farmers lime is a valuable auxiliary; but a greater amount of attention is required to ascertain the exact constituents of the peculiar description of lime to be used by them.

## A REVIEW OF THE FIVE LANDLORD AND TENANT BILLS FOR IRELAND, AS ORIGINALLY BROUGHT INTO PARLIAMENT DURING THE ADMINISTRATION OF THE LATE GOVERNMENT.

In a former number we alluded to the fact that Ireland, although nearly a century behind the United Kingdom in acknowledging the rights of the tenant, was now exerting her energies more indefatigably than either to procure a fair and final settlement of the question. In corroboration of this, we have now to state that during the present session of parliament no fewer than five bills have been introduced, connected with the subject. Four of these were introduced by the previous Administration, and ordered to be printed by the House of Commons, on the 22nd of November; and the fifth, introduced by Serjeant Shee, on the 25th of that month. Of the four government bills, one is *con amore* in favour of the landlord, and the others are in favour of the tenant. They have obviously been prepared with great care, and were introduced by the Attorney-General and Solicitor-General for Ireland, and Lord Naas; and their respective titles and objects are—1st, Land Improvement Bill, “To facilitate the improvement of landed property in Ireland by owners of settled estates;” 2nd, Tenant’s Improvements Compensation Bill, “To provide compensation for improvements made by tenants in Ireland;” 3rd, Leasing Powers Bill, “To consolidate and amend the laws relating to leasing powers in Ireland;” and 4th, Landlord and Tenant Bill, “To consolidate and amend the laws relating to landlord and tenant in Ireland.” The title of Serjeant Shee’s bill is simply, “Tenant-Right Bill,” and its object is “To provide for the better securing of and regulating the custom of tenant-right, as practised in the Province of Ulster, and to secure compensation to improving tenants who may not make claim under the said custom, and to limit the power of erection in certain cases.”

Such are the five measures in question. When they have passed the Legislature, and become statute, either conjointly or separately, we shall again revert to them, noticing the alterations made, and their adaptation to the objects they have in view. In the meantime, from the government changes which have taken place, it is no more than fair to glance at the originals.

The first of these bills—the landlords’—is now before the Lords; and our readers will recollect that the other four—the tenants’ bills—were read a second time, and referred to a Select Committee in the Commons, during the administration of the late Government immediately before its resignation; and that it fell to the present Government to appoint the Committee, and carry out the order of the house. A Committee was duly appointed; and from the importance of the subject and its comprehensive character on the one side, and the conflicting opinions of

members of the Committee on the other, it was proposed at the time of its appointment that the M.P.’s would have sought else to do during the remainder of the session but “kick in their coffins.” But the Leasing Powers Bill has made its appearance again in the house; and so will, it is hoped, the others during this week.

1st.—The Landlord’s Bill is based upon the beneficial working of the 10 Vic. c. 32, under the superintendence of the Board of Works, passed in 1847—“for the improvement of the estates of proprietors having partial and limited interests in the same, by means of public money advanced for that purpose;” and also upon several other statutes of a prior date, for similar purposes; but under the expensive and objectionable superintendence of the Court of Chancery in Ireland. The present bill is more liberal in many respects than its predecessors, making provision that proprietors under limitations and restrictions by settlements and wills may improve their estates with their own or borrowed money, under the superintendence of the Commissioners of Public Works in Ireland, as by the bill of 1847; while the class of improvements are more extensive, being as follows, viz. :—

1. “The drainage of lands by any such means as the Commissioners shall approve.
2. “Irrigation or warping of land.
3. “Embanking of land from the sea, or tidal waters, or rivers, in a permanent manner.
4. “Enclosing or fencing any land, or improving the fences, drains, streams, or water-courses of the land.
5. “Reclaiming of waste and other lands.
6. “Making farm-roads.
7. “Clearing land of rocks and stones.
8. “Erection of farm-houses and buildings.
9. “Erection of buildings suitable to scutch-mills for flax, and the formation of water-courses and weirs necessary for providing water-power for the same, not, however, including any machinery for such mills.”

Estates can only be burdened with a rent-charge for twenty-two years, of six and a half per cent. on the investment redeeming interest, the schedules being the same as in the bill of 1847. In many respects the two measures are similar; and therefore we shall only further notice their shortcomings at present.

The principal objection to the bill is its limited character—its making no provision for the almost unlimited variations experienced in practice. For example, the 23rd section states that “No authorization of any expenditure to be made under the provisions of this act shall be given for any sum or

sums exceeding in the whole *four years'* clear annual value of the lands intended to be improved, after deducting all public taxes, charges, and assessments, head-rent, chief and quit-rent, and tithe rent-charge."

Lawyers have always manifested a very great abhorrence to burdening entailed estates; and this is obviously the old song of not allowing the burden to exceed four years' rent. It is certainly making provision for the worst, which is always a wise and prudent maxim; but, unfortunately, the improver of his country is in this case taken up before he has fallen, for if the tenant of such lands is to be charged  $6\frac{1}{2}$  per cent., as is proposed by subsequent sections—such being the whole amount of the redeeming interest at which the money is to be borrowed or invested—then it may be fairly asked, what is the encumbrance effected upon the estate? and what the difference of rent at the expiry of the twenty-two years? In point of fact, as we shall show at some length in a subsequent article, improvements of the kind contemplated, as well as many others, if judiciously executed, instead of being a burden upon succeeding heirs of entail, are a very great acquisition, inasmuch as they enable tenants to pay their old rents more easily. Indeed, unless such improvements take place, heirs of entail cannot get their present rents. Hence the obvious conclusion, and the absurdity of the limitation in question.

Again, there are thousands of acres not worth 5s. per acre, or even the half of that, capable of great improvement—an improvement which such a clause obviously excludes. We invested £20 per acre in Ireland, during the few years we were in it, in lands not worth 10s. per acre, which, instead of  $6\frac{1}{2}$  per cent. returned from 25 to 50, and where four times the yearly rent or value of the land would not have returned  $6\frac{1}{2}$  per cent., or any per-centage at all. Indeed £6 per acre had previously been tried and turned out a complete failure, the whole investment being lost. There is nothing more short-sighted than half-done work in any department of agriculture; and the clause in question is only suited for high-rented land easily improved.

The arbitrary term of twenty-two years, with its equally arbitrary per-centage, is also not suited for the varied examples of practice. The profits of the farmer are seriously affected by the late revolution which has taken place in the price of produce and labour; and therefore, if money can be borrowed cheaper than formerly, or at  $2\frac{1}{2}$  to 3 per cent.—the redeeming interest and length of term ought to correspond with his profits, which in many cases demand a longer term than twenty-two years, with a corresponding reduction in the redeeming interest.

It may be enunciated as a general rule, that where the improvement returns or enables the farmer to pay redeeming interest, the investment should be made; and that where such is not the case, the improvement is *no improvement*, so to speak, and that the amount of redeeming interest be a matter of mutual agreement between the landlord and tenant, subject to arbitration

or settlement by the Board of Works only when parties differ.

There is a still greater class of objections to the limited nature of the bill than those above noticed, inasmuch as it makes no provision for progress in chemical improvement in agriculture, its provisions being almost, if not entirely, limited to mechanics. It is not easily accounting for such an omission as this, unless it be admitted that chemistry has not yet been introduced into court! Of the above sum of £20 invested by us, £10 were in the shape of chemicals (lime and manure), and they were better worth  $6\frac{1}{2}$  per cent. to the farmer, than the other £10 in mechanicals. "*Much is the mother of meal*" in court and out of court; and if the soil is deficient of manurial element, to bring it up to its highest degree of fertility, at which it ought always to be kept—a defect generally experienced—the investment of capital in mechanical improvements only may be lost money thrown away. Hence the obvious conclusion. To make no provision for that class of improvements which alone increases the produce, and enables the soil to yield the redeeming interest, is therefore a very serious omission.

The second bill—to provide compensation for improvements made by tenants—is far from what its title would lead tenants to expect. Tenants are to receive compensation for five classes of improvements; 1. Farm-buildings; 2. Reclaiming waste land; 3. Drainage; 4. Clearing lands of rocks, &c.; and 5. Boundary and internal fences. Thirty-one years' undisturbed possession is to be considered as compensation for Class 1; twenty-one years for Class 2; and seven years for 3, 4, and 5. A specification and estimate of intended improvements have to be served on the landlord, and a duplicate lodged with the Clerk of the Peace, with expenses of advertisement by the tenant; after which he may commence the work, if the landlord does not do so himself—which is optional; or if the Commissioners of Public Works do not refuse to authorize it. If he commence the work, it must be finished within three years, when he will receive a certificate of completion if it has been properly executed. The currency of the above compensation period commences "one year next after the date of the lodgment with the Clerk of the Peace of the plan specification," &c., and if at the expiry of his lease this term has not expired, the tenant will be paid proportionally for his investment. If, for instance, he invests £7 per acre in draining, and there remains one year unexpired, he will then receive £1, provided he pays 5s. per acre of rent; but if he only pays 2s. 6d., then he cannot receive more than 10s. The limit of four years' annual value coming here into operation as in the last bill, and so on for the other classes. No tenant is to be entitled to compensation if the landlord continues the tenancy; and if the landlord does not pay the amount of compensation due, the tenant may retain possession.

The bill also makes provision that tenants shall receive payment for crops in the ground, tillages and manure, which it may have received during the last

six months of his lease; also for straw, hay, manure, and growing underwood left on the farm.

"Tenants in lieu of emblements shall continue to hold their farms until arrival of the next Gale-day after the determination of his interest." Landlords have the option of taking at valuation fixtures erected by the tenant for agriculture or trade—failing which, the latter may remove them.

Such is a cursory glance at the principal provisions of this bill, the preamble of which is so flattering for the tenant. It is subject to all the objections brought against the first bill, and therefore we need not do more than refer to them, while it is subject to a worse charge—the *grosses injustice towards tenants*, for tenants have a full right to all the benefits arising from their own capital invested in the cultivation or improvement of the soil during the currency of their leases. To deny them this right by statute is (to use strong but plain language) little better than confiscation. It is the duty of Irish landlords to execute all the five classes of improvements specified by the bill. Hence it only provides that Irish tenants receive Irish pay for doing the work of Irish landlords. This is graphic, but literally true. Moreover, as the landlord bill allows landlords a redeeming term of twenty-two years for draining instead of seven, as proposed for the tenant, and  $6\frac{1}{2}$  per cent., or indeed any increase of rent which the Commissioners may award upon the tenant, it is not the most profitable lands to drain that will fall to the latter to be performed. Indeed, he is a penniless landlord who will leave even  $6\frac{1}{2}$  per cent. itself to the tenant; so that the bill, if it does pass into law, will in all likelihood be a dead letter on the statute-book. The sound practice is for Irish landlords to perform their own agricultural duties themselves; failing which, it shall be competent for the tenant to do so at the expense of their properties, in terms of their own statute, so that a single clause, added to the landlord's bill—had it been a perfect one—enabling the tenant to perform his improvements where he failed to do so himself, is all that the tenant requires for compensation. We cannot see the propriety of one law for the landlord, and another and a very different law for the tenant, when there is one work and one only to perform.

**Leasing Powers Bill.**—This is a most important measure. Many landlords cannot grant leases as they otherwise would do, owing to entails, &c.; and the bill not only makes provision for duration, but also compensation from heirs in succession. Agricultural leases may be granted for thirty-one years; improvement of waste, bog, &c., sixty-one years; mining, forty-one; building, ninety-nine; and public, nine hundred and ninety-nine. For each of those classes covenants are prescribed, and various provisions made.

The periods of compensation binding on successions are for agricultural buildings, forty-six years; reclaiming of waste land, twenty-five years; farm-roads, ten years; drainage and irrigation, ten years; clearing of rocks and stones, seven years; fences, seven years; marling, liming, claying, &c., five years; manuring and all other improvements not specified, two years.

This bill has been reprinted, with the amendments of the Select Committee, and is referred to a Committee of the House on the 11th instant, by which time we hope the others will also make their appearance, and that the government will then divulge its own measures, as promised by Lord John Russell at the opening of the session, who announced that "The Lord Chancellor will state in a few days what are the measures he proposes to bring in for the improvement of the law—more especially with regard to the tenure of land in Ireland" (we quote from the *Times*' report of Feb. 11). The alterations made in this bill by the Select Committee are not what the peculiar interest of parties—especially the tenant—at present demands. We shall soon return to the subject in a different form.

The Landlord and Tenant Bill is a long document of fifty pages, besides some six pages of indices; altogether it is a measure prepared with great care and labour from the statutes of the past two hundred years, embracing "*Contract of tenancy*," "*Assignment*," "*Sub-letting*," "*Registry of leasehold interests and evidence*," "*Rights and reservations*," "*Prevention of waste, and law of repairs*," "*Covenants and conditions*," "*Actions for rent*," "*Distress for rent*," "*Ejectment for non-payment of rent*," "*Ejectment for overholding*," "*Ejectment for deserted tenements*," "*Ejectment in other cases*," and "*General provisions*;" so that from its comprehensive character we cannot on the present occasion glance at even the merits of its provisions. That the Law of landlord and tenant requires revision, there cannot be a doubt, and the sooner that this is effected so much the better; is a proposition equally true; but that the present bill will effect this improvement is a very different question. Much is said in its favour on the one hand, and very heavy charges brought against it on the other.

The Tenant Right Bill of the hon. member for Kilkenny (Sergeant Shee) has reference to the Ulster custom, of which our readers have heard so much. It is a custom wholly one-sided, being in favour of the tenant only, landlords having no resource against the tenant for the exhaustion of the soil, and wear and tear of the subject let, in the absence of stipulation; but were compensation to become a legal question, the opposite would be established, to the ruin of many a poor tenant in Ulster. The exodus, advance of wages, reduction of the price of produce, progress in machinery and chemistry, twofold expenses of houses, fences, and roads on small farms, compared with those on large, and the stimulus which such gives to the consolidation of small farms, are all against the Ulster system, and cannot fail to be experienced in the march on which landlords and tenants are now setting out, as a millstone about its neck.

Such is a very cursory and imperfect glance at the five bills in question. That they declare progress cannot be questioned. That they fall short of the wants of the tenant is but too true. Chemistry is wanting, and this is a great necessity; and equally defective is the subdivision of labour in agriculture; still it is encouraging to be making progress.

## W A G E S .

## THE EQUITABLE WAGE PRINCIPLE v. THE LAW OF SUPPLY AND DEMAND.

## No. V.

I beg my readers to allow me, before proceeding with this letter, to recapitulate slightly.

I have said, giving Mr. Stewart Mill as my authority, that production is generally a joint affair; one party contributing the materials, tools, shelter, food, and superintendence necessary for the due performance of the work, and the other doing the work itself.

I have said also that production is thus a partnership affair between the man of money and the man of muscles, in which the monied man agrees to advance to the working man his share of the produce in the form of wages.

These I maintain to be the simple elements of the labour question; and however much the great capitalist may scorn the notion of the partnership subsisting between himself and his hired workman, it is not the less true for all that; and it is to his shame and confusion if he practically denies it.

But how is the share of the produce *justly* accruing to the working man regulated? Does the law of supply and demand regulate it? If you say it does, then the instances I have brought before you of the evil effects of this law, and of its direful operation wherever it is enforced (and that is nearly everywhere) have signally failed. Backed by all the evidence I can procure, I maintain that the law of supply and demand fixes a wage, *but not a just wage*; it does not enact for the working man that share of the produce *justly* accruing to him. I have adverted, in Letter III., to the frequent disagreement between legal and moral right; it seems clearly enough to obtain here, for we behold law at variance with justice.

Now this fundamental contract, based upon that sense of justice which naturally underlies and solidifies all the relations of men, is violated. I here attack the wage principle as it works in the present day generally. In place of the original compact, I see a new law established, by which the *necessities* of the labouring man—instead of *equity*—are made to determine the value of his work. This law, taking no heed of the result—that is to say, whether the value of the materials upon which the workman has exercised his skill has been doubled or increased even a hundredfold by the operation—says that the proportion of the wealth which is to come to the labourer, is to be regulated by no other principle than what the capitalist can induce or force him, by chi-

canery or starvation, into accepting. To quote a solitary instance, "the padlock that is made for a halfpenny is sold for a shilling."

It does us good to stop now and then, during the hurried march of life, and the absorbing struggle for life, in order to look back at the "old times." Whilst there is much that we would on no account revive, necessarily attendant upon a state of semi-barbarism, there is much of simple equity that distinguished the dealings of our forefathers, and gave spirit and stability to their laws; much of a beautiful spirit of mutuality and brotherhood, that sheds an occasional ray upon those early days, together with a stern grand species of rectitude and moral independence, that gives a name and a character to our country, which we may well desire fully to regain, to conserve, and to transmit.

True property has the idea of mutuality attached inseparably to it.

Of old, several men would join together, and agree with one man that he should look after certain of their interests for them, while they would in return look after certain of his interests for him. This was the relation of *homagers*, and *mutuality* was the essence of relation. This spirit of mutuality pervades our whole constitution, so far as it rests upon the common law—mutual obligation, mutual responsibility. The common law provides that it should be so between individuals and neighbours, between the ministerial office and those he is head over, between the crown and the subject; and the fact of the stability of the common law may be easily traced to its foundation upon this essential principle of human nature. Centralization disowns this principle, and the best motives and powers of man lie crushed therefore beneath its sway; and the nation that thus loses this mutuality of spirit loses its main strength—*independence*. Its individuality—is it not weakness, stagnation, despotism, crime? yea, a blot upon the map of the world!

Bracton, quoting from this common law (Bracton de Legibus, lib. xi, c. 35, § 2), says with peculiar significance that homage is the bond by which "any man is held and bound to guarantee, defend, and maintain his tenant against all men; and, on the other hand, by which the latter is bound himself to render due service thereof. Thus homage is contracted at the will of each, as well lord as tenant; and, on the other hand, it is dissolved at the will of either, for nothing is so agreeable to natural equity

as that everything should be able to be loosed by the same means as it is first bound by." And Glanville says (Glanville de Legibus, lib. ix., c. 4) that "as much as the man owes to his lord for the sake of homage, so much the lord owes to him for the sake of lordship."

But we find a different state of things brought about by our Norman conquerors. They established the feudal system, with its despotism and slavery. The workmen during this period were all velleins; either "villeins in gross," performing the lowest household duties, or "villeins regardant," attached to the soil, and being specially engaged in agriculture. The services rendered by them were either arbitrary—that is to say, dependent on the mere will of their lord, which constituted a state of "pure villeinage"—or certain and defined, which constituted privileged villeinage, or "villeinage socage"; but in either case the person and property of the vellein belonged entirely to the lord, *for the labourers were incapable of acquiring anything for themselves.*

The legal disabilities under which men then laboured have, it is true, been removed; but care has not been taken that the *wrong* shall not be perpetuated; how else can we account for the dependent condition of the workmen?

When the villeinage system of labour was abandoned, there arose another, called the "hiring system," by which "the compulsory vellein of old was changed into the voluntary bondsman; the serf into the servant"—the sole distinction being, that for the sake of a small pittance over and above his subsistence (and often not that), the workman was made to part with all right to participate in the wealth he created, *for so long as he continue the servant of his master.*

And who that looks round about him can fail to see this identical system in force now? The workmen are hirelings, bartering their services for a little present subsistence, and deprived from participation in the riches they produce.

To those of my readers who may object to the ground I take, so far as to say, The labourer has *no right* to any such share as you mention, I attempt no reply; but to those who maintain that the law of supply and demand *accords to him the just share of the produce*, I hope to address my next letter.

## NO. VI.

Upon referring to history, and consulting the spirit of the old Saxon laws, we come to the conclusion that we have lost much of what was admirable, and retained much of what was vicious. In great

\* The term "compulsory vellein" reminds me of the expression lately used by President Pearce to designate slavery. Yielding to the refined sentiment of the age he is pleased to call it *involuntary servitude!*

measure we have lost or over-looked the *mutuality* of interest that was formerly enjoined, and to a certain degree, practised, and held fast to the slavery of the feudal system, or, in other words, justified pure villeinage, "the wrong of which consisted," as I stated in the last letter, "in depriving the labourer of the property he inherently possessed in his labour." I supposed at the conclusion of Letter V., that my readers made two objections to my line of remark: 1st, "That the labourer has *no right* to any such share of the produce as has been mentioned," of which I shall take no notice; and 2ndly, "That he does obtain his fair share of the produce," to which I intend now to reply.

It does not seem possible to consider the law of supply and demand (and no other law is recognised as regulating wages) capable of adjudging a *fair* share of the produce accruing to the labourer, seeing that it pays no regard to the *value* of such work, but accords remuneration to the work-people only from a sum arbitrarily set aside by employers. The law in question makes wages to depend upon the wage fund: justice would instantly declare that they should depend upon the produce fund.

The elements of production are of three kinds:—1st, labour; 2nd, instruments, buildings, shops, &c.; and 3rd, materials. To provide for all these there must, of course, be a fund, 1stly, for the maintenance of labourers; a fund, 2ndly, for the purchase of machinery and implements; and, a fund, 3rdly, to furnish the materials for work. Beyond this there is the produce fund, which is identical with the increased value that a workman, by the exercise of his skill, gives to the materials on which he operates. This may be called a profit fund. I will at present speak of the material fund and the wage fund only, into which two the three may be reduced.

There exists considerable difference between political economists as to the theory of wages, and the pivot upon which they balance. "Universally then," says James Mill and the school that he leads, "we may affirm that, other things remaining the same, if the ratio which capital and population bear to one another remain the same, wages will remain the same; if the ratio which capital bears to population increase, wages will rise; if the ratio which population bears to capital increase, wages will fall." Coker, the authority of a more modern school, considers the rate of wages to be simply the ratio of remuneration of the labourer to the quantity of work performed by him, or, in other words, that the wage law is simply this—that the rate of wages is proportional to the quantity of work, considered in connexion with the quantity of pay. The gross quantity of work to be done, divided by the number of hands to do it, gives us the average quantity of *work* accruing to each workman; and the gross sum devoted to the



payment for such work, divided again by the number of hands, gives us the average remuneration of each workman. The *ratio* of the quantity of work done to the amount of money received in remuneration for it, is the rate of wages, or the given amount of pay for the given amount of labour. This is very different from the law of supply and demand, "which," to borrow the words of a recent writer on this subject, "says that the rate of wages is determined by the quantity of work to be done, and the number of hands to do it; whereas, the relation of the hands to do the work can but regulate one of the necessary conditions, *viz.*, the average amount of *work* accruing to each labourer. The above law is, moreover, very different from the other form of the wage law of the economists, which declares that the rate of wages is determined by the proportion between the labouring population, and the amount of capital devoted to the remuneration of them, for this can but regulate the average amount of *income* accruing to each labourer." Among the economists, all idea of work seems to be discarded from the question; though to every one of simple apprehension it must be manifest, that wages remaining the same, and work being doubled, the remuneration for labour must be decreased one half; and it is thus impossible to come to a right understanding of the case, unless the quantity of labour is allowed to enter into the proposition. Suppose two millions and a-half sterling to be the sum annually expended by the metropolitan tailors upon the purchase of cloth, and that there are in London 25,000 operative tailors engaged upon these materials; each operative would thus have £100 worth of cloth to work up. With this information, the law of supply and demand would stop. It could teach us no more, because it

has nothing to do avowedly with the *fund* out of which labourers are paid. Let us presume that the gross amount paid to these London operative tailors is one million and a-quarter: there being 25,000 in number, each would receive, on an average, £50. Still the *rate* of wages is not determined fully. The following formula will, however, possibly give it: as £100 (the value of cloth trusted to each operative in the course of the year) is to £50 (the sum he receives for working it into garments), so is 10s. to £1; which is the rate at which he is paid for making up every sovereign's worth of cloth. A simple example in the rule-of-three will serve our purpose here, and give distinctness to foregoing remarks.

Estimate the capital of the country at £1,000,000, and allowing £500,000 to be spent upon materials, £500,000 will consequently remain to pay for working up those materials into articles of food and use: then £500,000 : £500,000, :: £1 : £1, or the rate of wages will be 20s. for every 20s. worth of materials worked upon. If out of this capital £750,000 is devoted to materials, only £250,000 is left for labour, and the result is as follows: as £750,000 is to £250,000, so is £3 to £1, being a lessening of wages  $\frac{2}{3}$  on every 20s. worth of material made up.

Viewed in this way, the rate of wages must simply mean the sum received for so much work: "the ratio of the remuneration to the *labour*," according to Coker, and not to the *number of people*. I felt obliged to set this question at rest before I could go on, or I should not have given so much space to the consideration of it. It is necessary to my after-conclusions, however, that the present ground should be clearly apprehended; for if I am wrong, I stand more easily corrected; and if right, my readers are sensibly assisted.

F. R. S.

## ON DRAINING.

Frequent draining being devised and executed for the purpose of collecting and carrying away from the land the excess of moisture that stagnates upon the surface and is injurious to vegetation, two very especial provisions are required for the complete advantage being developed; *viz.*, that the water reaches the top of the drains in the least possible time, and that it is with equal quickness conveyed into the drains through the covering that is laid over the materials with which the cavity is filled. After all that has been spoken and written on the subject of draining, the two purposes may never be better effected than by the practice of his Grace the Duke of Portland, on his landed estates in England and the west of Scotland. The land

is laid into ridges of 14 or 15 feet, and kept in the same position; a drain is placed in each furrow, a tile in the bottom, and over it some straw, or an inverted grass turf. The continued gathering by the plough of the ridges in the same position forms a convexity which throws the water to the drain, and the shallow covering over the cavity transmits the water, without delay, to the conveying channel. The most viscous and obdurate clays will require to be ridged in 12 feet distant; medium clays at 15 feet, and alluvial clays, as in East Lothian, and over Scotland, at 18 feet. Beyond that width, the soils are not clay fallows, but porous and mixed alluviums, which may be drained in 24 feet. In the latter cases, a cross or

slant drainage may be suitable; but all clay lands that require summer fallowing are much best drained in the furrows, as above-mentioned; and such is our opinion, after having wandered over every phase of the draining world.

The depth of drains may be averaged at 2½ feet for all soils and circumstances. Such was the opinion of the late Mr. Smith, of Deanston, expressed in a private conversation to the writer of this notice. The Duke of Portland says, that "in all purely clay soils, the drains cannot be too shallow, provided they are not disturbed." No greater truth has ever been uttered on the subject; the covering of the materials below the plough furrow may not exceed two or three inches, in order to filtrate easily the water that comes into the furrow. The Duke's opinion must pass as an incontrovertible truism on draining clay lands. The depth of 2½ feet will receive the surface water as above directed, and will intercept the water that may rise to the surface in permeable strata, and water will run in a drain 2½ feet below ground as harmlessly to the surface ground as at the depth of 20 feet, or any other number. And it is hardly to be credited that any permeable stratum that throws water to the surface will run longitudinally between the drains, without crossing the line and being intercepted. This position cannot be received.

The arrangement between landlord and tenant for the execution of draining has never been so equitably made as by the Duke of Portland. His Grace provides all materials, and employs his own workmen to execute the drainage; the farmer all cartage required, and the straw, turf, or loose materials for covering. The farmer pays 5s. for every drained acre, along with his half-yearly rent, which refunds his Grace in 3 or 3½ per cent. for the outlay; the essential purpose is obtained of all permanent doings being performed by the landowner, who has the very just satisfaction of the work being properly executed, and durably to continue for future benefit. This is a very important consideration in the joint purposes between landlord and tenant. The Duke of Portland's arrangements and calculations on such subjects are never disturbed by any subsequent evanescent theories, but remain fixed as rocks at the bottom of the sea, that are not lifted up and down by tides.

When land is drained in a state of grass, there will be fresh matters in the soil for decomposition, and then the liberal application of calcareous substances becomes highly desirable. It has been admitted, in all ages of the world, that the draining of marshes, and of stagnant waters, is highly conducive to health and salubrity; and we may very reasonably suppose that the frequent draining of wet lands, though performed on a smaller scale,

will operate in a similar manner. It carries away or prevents the generation of the pestilential miasmata that originate in distempered and poisonous bodies; and lime arrests the noxious effluvia that tend to rise, more or less, from every soil, at certain seasons of the year, and decomposes them, or causes their elements to assume new forms of chemical combination, in which they no longer exert the same injurious influence on animal life. How beautiful a consequence of agricultural skill, that the health of the community should be promoted by the same methods which most largely increase the produce of the land! Can it be doubted that the all-benevolent Creator of the world places this consequence so plainly before mankind as a stimulus to further and more general improvement—to the application of other knowledge, still, to the amelioration of the soil? What a noble employment for the mind of man! By the use of his reason, his energies, and his capital, he affords, in the first place, employment for his fellow-creatures, then an increase of food and health to the human race, and, lastly, a remuneration for himself. What more can his heart desire? There is nothing wanting to satisfy either the selfish or philanthropic mind. A very heavy and unextinguishable responsibility rests on those persons who possess the means and the power of conferring such invaluable benefits on the human race, and who continue ignorant and unwilling, or incapable of action, in spite of the proofs of science, and the sanctions of experience. Under the wide expanse of heaven, there is not, and cannot be, a more gratifying employment than the improving the condition of the human race; and as the physical condition must ever precede the moral, the improvement of which we are now treating must claim a prominent place among the agencies that may be employed in effecting that object. There is a wide difference between the employment now mentioned, and the fooleries that so much engage the attention of mankind—that degrade the intellect, vitiate the morals, and debilitate the body of man. Here is employment, food, and health to be derived from a source the most rational under heaven—from the cultivation of the earth, which is the inalienable patrimony of the human race. It is not a little surprising that any draining should remain unperformed, the proofs of the beneficial effects being so many, so strong and undeniable. The results are not confined to the individual who performs the business of draining; they swell into national importance, and claim the attention of the philosopher and the statesman, as well as of the cultivator and owner of the soil. Every interest must give way to the general interest. But here is no opposition, or any jarring

contention; for every party is benefited, and the general good promoted. The labourer finds employment, and the farmer obtains an increase of produce, and the landowner gets his property improved in value, and a remuneration for his capital;

the nation enjoys a climate improved and salubrious by the process, and an increase of food, the essential element of life, on the regular and ample supply of which the prosperity of any social community almost wholly depends.

### CLOVER SICKNESS.

What can we do to ameliorate clover sickness? is a question which has now almost ceased to be asked, because the answer is usually considered as hopeless. The cause is, we are quite safe in saying, still enveloped in obscurity. Of the many theories set up, there are none which will bear a strictly scientific investigation; and as the chief food of the turnip, or that at least which it principally is found in practice to need supplying, is that which it contains in its composition—in a very small degree—the phosphoric acid: so it is not unlikely that the cause of the failure of clover will be found to depend on some material being wanted, so small in quantity possibly as scarcely to be perceptible to ordinary chemical tests.

Ever since the days of Sir Humphrey Davy, there has been a vague indefinite idea that it was a want of gypsum in the soil, which caused the failure of the broad or red clover. He described that material, if we rightly recollect, as the bones of the plant; and many have been the dressings of gypsum which have been bestowed in a variety of shapes, with a view to test its efficiency in this particular.

Another class of writers suggest the loose light sandy state of the soil as the cause of the disease, and allege that owing to this mechanical state of the land the root becomes liable to be thrown out in the spring, and that the failure is thus attributable to its mechanical rather than to its chemical condition. With this view, rolling and consolidation are recommended, and we must admit that the land most subject to clover sickness is that which appears the loosest and the lightest, and so far seems to favour the theory; but if strong clay were never subject to the disease, it would be a more consistent theory than we are sorry to say it is, for we can point to thousands of acres of strong land where the clover is as subject to go off as in any other kind of soil in existence.

A third class of chemists maintain it to be owing to the want of soluble alkalies, such as potash, in the soil; and they endeavour to show by analysis that soils where clovers go off are possessed of less of this material in that condition than neighbouring fields not subject to this visitation.

There are many other instances abroad, and some tending to the Decandolleian theory of poisonous exudations; but all agree that it is im-

possible to grow red clover for two or three four-years' courses, and that it is very difficult to obtain it even at intervals of eight years. And yet, contrary to all plausible theories hitherto stated, it is found in Scotland that a five or six-course system is more favourable to the red clover than a four course; in other words, a system of husbandry, where the land lies under clover for three years out of the six, or for six years out of the twelve, is more favourable for the growth of clover, than if it were grown one year out of the four or three years out of the twelve.

We have found, in the course of our own experience, that a crop of tares introduced to a four-course rotation, and cut green or dried for fodder, to produce an effect decidedly favourable to the clover, and have in the next rotation grown the red clover most successfully.

Again, we have ourselves given the gypsum a complete trial. Selecting that part of a field well known to be clover sick, we sowed some four hundredweight per acre with the barley and seeds, so as to give it a full opportunity of being amalgamated with the soil, and being in a state fit for assimilation for the clover the succeeding spring. The crop, however, went off as pertinaciously as ever. The more scientific have advised sowing in the clover itself, during the time when there was dew upon the plant. This we adopted in a beautiful clover field where we knew the latent tendency existed; but the result was, that not one particle of difference could be perceived on the plants, or on the field where the dressing had been given, and the parts where it had been omitted.

Still we think we have almost arrived at a point where we may venture at least to hold out hope to the cultivator that the plant, or at least its prototype, may not be altogether lost.

Since we have persevered in applying *dissolved bones*—and *not* bones dissolved, or converted more properly into partial superphosphate, and then reconverted into simple divided phosphate by the admixture of ashes, but dried and subdivided by the admixture of saw dust or some similar substance—we have found the red clover keep better hold of the soil. On lands where this has been applied three times in due course, or in twelve years, we have little difficulty in growing what we sow instead—viz., the perennial clover or cow grass;

a plant of the same value in every way as the red clover, and which has a somewhat more tenacious hold on the ground than the red clover in its biennial form.

We pretend not to say what may be the cause of all this. It may be we get better turnips and have more consolidation; it may be that the phosphoric

acid or the ammoniacal matter is more plentiful; or it may be that *there is more sulphuric acid in the soil*—we will not, however, vouch for this being the case; but we should like to hear if the practice of others at all bears out our own, for we now calculate upon a crop of cow-grass once in eight years, and are not disappointed.

## ON ADVENTITIOUS AIDS TO PROMOTE THE SPEEDY GROWTH OF THE TURNIP PLANT.

As the period approaches for putting in the turnip crop, I will venture to offer a few suggestions relative to the use of artificial aids to promote the speedy growth of the plant, so that it may be forced into rough leaf as early as possible, and thus in a great measure be placed out of danger from the turnip fly; as also, by being greatly stimulated thereby, it soon darts its young fibrous roots downward in search of the rich food supplied by the fold-yard manure, which, I think, ought in all cases to be applied to the production of this crop. The following artificial manures are, however, well adapted for this purpose:—

Peruvian guano mixed with loam, ashes, or compost.

Bone-dust mixed with partially decomposed fold-yard manure, fine loam, or similar substances.

Superphosphate of lime well mixed with ditto.

Rape cake, ditto, ditto.

Putrid substances, ditto, ditto.

Horse and pig dung, ditto, ditto.

Pigeon and poultry dung, ditto, ditto.

Night soil, ditto, ditto.

Sewage manure deodorized and dried, ditto, ditto.

The two latter manures require especial notice: they are very valuable under proper management and application. I deeply regret that so little attention is paid to ensure their collection for the use of agriculture. I know that several companies have been formed, and are in course of formation, not only in London but also in the provinces, for this purpose; still they do not meet with that countenance from the more enlightened portion of the agricultural community which they deserve, being looked upon with suspicion, very slow progress is made.

I have before me a prospectus for the formation of a London company, which states that the cost of producing the dry manure will not be more than 25s. per ton, and that the addition of phosphate of lime, &c., will not exceed 15s. per ton; so that we have a highly fertilizing manure, collected from London sewage, perfectly deodorized, and enriched by the addition of phosphates, for the cost of 10s. per ton. It is further stated "that the sewage flows into a suc-

cession of reservoirs, and is deodorized immediately, in an air-tight vessel. The water is discharged clean and clear, and the residuum converted, by means of the patent desiccating process, into a perfectly dry guano. The operation of purifying commences immediately, and is complete in forty-eight hours; and every offensive and noxious smell is fixed and precipitated with the residuum." I took an opportunity offered me to visit the premises connected with the prospectus given me. I found them in Puddle Dock; and the appliances, which are of the simplest kind, certainly effected every transition of the sewage into an inodorous, dry guano, portable in bags, exactly like foreign guano; and I was told that with the addition of about 20 per cent of phosphate of lime it is quite equal to the best Peruvian in its fertilizing qualities. On this point I shall not offer an opinion; but this I do assert, that it is a very valuable manure, can be offered to the agricultural interest at a very cheap rate, and is consequently well worthy of their attention. The patentee of the deodorizing process assured me that he only wanted the company to be formed of intelligent agriculturists, to whom he should be willing at any time to relinquish his patent, and its corresponding advantages, upon the most liberal terms; reserving to himself, however, the department of engineer to the company. The sewage he has secured, by lease of twenty-one years from the City of London, are those flowing into the Thames by Puddle Dock, Paul's Wharf, the Dowgate, and Lower Thames-street sewers, with all their various branches, capable of producing daily upwards of thirty tons of dry residuum ready for immediate use; so that from this one source alone, we have a supply of about 10,000 tons of home-made guano, nearly equal to the best Peruvian.

I wish this could be carried on throughout the metropolis, and all provincial towns; what an immense resource would thus be opened to us! quite sufficient, I presume, for our immediate wants, or at all events for the purpose of application to the turnip plant, which is the principal object I have in view while writing this short article.

The turnip plant in its early stage is tender, and subject to the attacks of numerous enemies. As a cultivator of many years' standing, I have invariably found the best remedy against these attacks is to have the soil in the most perfectly pulverized state to which I can possibly bring it. The Swede turnip I always grow on ridges from 24 to 27 inches apart, manured with from 12 to 16 loads of fold-yard dung, the seed drilled in with some of the adventitious aids in manures enumerated above. Mangel wurzel I put in as the swedes; but the common varieties of turnip I put in on the flat, still adhering to drilling composts of some kind. The cheapest I make is composed of a collection of night soil, pig manure, pigeons' and poultry dung, dead animals, and other similar substances: this I mix with virgin loam, decayed leaves, roots, or vegetable matter, keeping them from year to year as I require them; which mixture is generally drilled in with ashes made from sods collected around the fields, twitch, and the like, and the proportion drilled is 4 bushels of the "collection" (before mixing) to 40 bushels of ashes and compost per acre. In the whole of my experiments I can say I do not recollect a failure since I adopted this course of management, which has now extended over a period of nearly thirty years; and my aver-

age growth throughout would exceed sixty acres annually.

A word, and only a word, to "Looker on": my object is solely to advance the prosperity of British agriculturists. If in my humble way I call forth animadversions, I wish they may never be taken up in a more ungenerous spirit than by "Looker ou." I cannot see that I "reach beyond the realms of truism: read Mr. Caird's speech at Wigtown, April 19th. "One who has Guided the Plough" must also have a word in reply. I regret my time will not permit me to go into discussions. I would not enter upon a farm under an unreasonable landlord, without compensation clauses certainly. If by improved appliances (ploughs) I can plough land at 5s. or 6s. per acre, why should I pay 10s. or 12s.? Perhaps my case may seem unreasonable; but thousands of light lands are ploughed at that rate, and I believe charged the higher sums. I must say I discard bare fallows. If I could not profitably grow turnips or rape, I would put in a green crop for manure. I think incoming tenants are often called upon to pay for improper management, of which laying manures in large heaps would be one. I want an equitable system throughout the kingdom, and your strictures will, I hope, aid me in its establishment.

P. F.

#### WHAT ARE THE PRINCIPLES ON WHICH LAND SHOULD BE VALUED?

What are the principles on which land should be valued? The Ordnance survey of Ireland is the best public survey ever made in any country, if we except that of India, now in progress. It was undertaken on a larger scale than that of England, that it might serve as the basis for a general valuation of the country; and that valuation, made under the direction of Mr. Griffith, as Chief Commissioner, and commonly called "Griffith's valuation," is the most systematic with which we are acquainted. It is far superior to most of the valuations of parishes and estates made in England by individual proprietors, independently, and too often on no system whatever.

We do not mean, however, to assert that the Irish valuation is perfect, and that our land-agents and land-valuers could not improve upon it, as well as upon their own practice in the art of valuing land, if they would only apply themselves to the task. In Ireland the government is expected to do almost everything for both landlords and tenants, even, as we heard an Irishman once observe, to the milking of their cows; and the general valuation was undertaken by the government, in consequence of loud and repeated complaints of the unequal assessment of the county rates, which are the heaviest, and

were till of late almost the only impost borne by the land in Ireland.

The two most important elements in the valuation of land are its quality or capability of producing, and the price of the crops which it produces. The former may be considered the most permanent, being affected chiefly by improvements in agriculture: the latter is fluctuating, and depends upon a variety of causes. In order to insure uniformity in the latter respect, so that the relative value of lands should be the same in the same county, or in different and distant counties, though made at different and distant times, the legislature fixed a scale of prices for wheat, barley, oats, potatoes, beef, mutton, and pork, as the standard for the valuation; all valuations to be given as if the standard prices were the actual prices at the time the valuation was made. Supposing the intrinsic quality of the land, therefore, once accurately determined at those prices, the value according to the government valuation would be capable of easy reduction to the actual value, at any time, by a comparison of the standard prices with the actual prices; and the only other corrections required would be for increased productiveness arising from improved methods of cultivation, from additional facilities for conveying produce to market

afforded by roads, canals, and railways, or from a redistribution of the centres of population. It is to the means employed for determining the quality of the land, to which we shall confine ourselves on the present occasion. The Chief Commissioner was empowered by the Act to appoint valuers, or, as they are called in Ireland, *valuators*, who were required to be conversant with, and professionally employed in valuing lands and houses, or in the case of towns, in valuing houses only. The Ordnance six-inch maps of the district to be valued, were placed in their hands; and they were required to lay down on them the different qualities of land, to designate them by numbers, and to enter in their field book, on the spot, the value which they assigned to each number at the standard prices. For the purposes of this valuation, the Ordnance survey of Ireland was made on the scale of six inches to a mile, or 13½ chains to an inch. The boundaries laid down on those maps are the public divisions of counties, baronies, parishes, and townlands. The county rates are levied on the townlands. Townlands are a smaller public division than any we have in England; and though, in Ireland, most townlands contain many occupiers, they seldom exceed the size of an ordinary English farm, and are frequently even smaller. Besides these territorial boundaries, the Ordnance maps frequently show the principal field-fences, all bogs, lakes, rivers, plantations, gardens, houses, ancient forts, and other remarkable objects, which data, with occasional measurements, are sufficient to enable the valuer to mark on the map any particular point or line which he may require, in order to divide a townland into any required number of portions, each representing a difference in the quality or value of the land.

In a copy of instructions to the valuers which is now before us, it is recommended that on cultivated lands valuation lots should rarely contain more than thirty acres, and never exceed fifty acres except under peculiar circumstances; and that even in the case of lands of nearly the same value, small divisions should be used in preference to larger lots, as likely to give more accurate results. To determine the quality of the land, the valuers were directed to ascertain the depth and composition of the soil and subsoil by digging. These were to be the principal grounds on which they were to form their judgment of the value.

The appearance of the crops (add the instructions) will frequently lead the valuator to put a high price on light or bad land highly manured, which would be unjust, as it is the intrinsic, and not the temporary value of the land, which is to be ascertained. On the other hand, they are directed to pay particular attention to the quality of the herbage on pasture lands, and to observe on tillage lands

the prevalent indigenous plants, as frequently indicating a particular quality of soil and subsoil, not to be distinguished by digging alone. Of low flat, and usually wet and cold lands, which have either never been tilled, or not tilled for many years, but are usually mown, it is directed that they shall be valued not solely according to the appearance of the soil when turned up, but partly by it, and partly by the quality of the natural vegetation; because when examined by digging, they sometimes manifest so cold and unfruitful an appearance as might cause them to be rated at less than their actual worth as compared with the adjoining uplands. The valuers were required to enter in their field-books a short but clear description of the nature of the soil and subsoil of each valuation lot; and, in order that precisely the same meaning should be attached by them all to the same descriptive word, a certain classification of soils was adopted.

The classification of soils laid down by Mr. Griffith, in his instructions to those who are employed on the general valuation of Ireland. He arranges soils under four principal heads, as argillaceous, siliceous, calcareous, and peaty. The argillaceous soils are subdivided into clays, clay loams, and argillaceous alluvial. Clay is the predominating ingredient in these soils, but they differ in the colour as well as proportion of the clay which enters into their composition. Soils consisting of blue or yellow tenacious clay, upon a retentive subsoil, are ranked as nearly unfit for tillage, but capable of improvement when on an open subsoil. If they contain a due admixture—but we are not told how much—of sand, lime, and vegetable matter, they constitute good wheat soils; and where the climate is favourable, are classed as the most productive. A stiff clay, by a judicious mixture of sand, lime, and organic matter, may become, we are told, a rich loam after long cultivation. A strong clayey loam is described as containing about one-third, sometimes more, of clay, with sand, lime, and animal or vegetable matter, sand being the predominant ingredient. A friable clayey loam contains less clay and more sand, and these are more perfectly mixed.

We cannot see why loamy soils do not in this arrangement constitute a fifth class intermediate between the argillaceous and the siliceous; but though such a definition is given of the composition of loams, we are told in the instructions that the term is to be understood as comprehending "soils of a fine tilth, which are composed chiefly of argillaceous and siliceous earth, and which do not form clods when ploughed in wet weather." According to our view, a certain amount of coherance, when wet, is a characteristic of even sandy loams, which distinguishes them from sand.

Siliceous soils are subdivided by Mr. Griffith into sandy, gravelly, slaty, and rocky. Sandy soils are described as giving all the gradations from an open sandy loam to pure sand; and as varying much in their value, according to the quality of the sand. In gravelly soils, coarse sand and gravel predominate: with a sufficient admixture of loam—here again we require to be informed of the proportion—they usually produce excellent corn crops. Slaty soils occur on the sides of mountains composed of slate rocks, whereby cultivated portions of the slaty substratum become mixed with the soil. Rocky soils contain fragments of siliceous rock on a rubbly substratum of the same: when the rock is limestone, they are classed with calcareous soils.

The subdivision made of calcareous soils is into limestone soils, limestone gravel soils, and marls. Limestone soils consist of finely-pulverized limestone: they are by no means common, and constitute the best grazing grounds. In limestone gravel soils, calcareous gravel or coarse calcareous sand forms the prevailing ingredient. Marly soils are defined as consisting of clayey marl—that is, of clay mixed with calcareous matter, and of white or shell marl. This last is only found at the bottom of lakes, sluggish rivers, and small bogs. It constitutes beds, twenty feet thick, on the banks of the Shannon.

Of peat soils there are two divisions, viz., moory soils and peaty soils. Moory soils are distinguished from the foregoing varieties by their containing more or less peaty matter, and assuming the appearance of a black or dark brown friable earth. When the peaty matter amounts to one-fourth, and the remainder consists of earthy matter, they are usually productive, particularly where the substratum consists of clay or clayey gravel. The quality deteriorates with the increase of the peaty matter. When it amounts to one-half, good crops are not obtained without frequent manuring. Peat soils are composed wholly of vegetable matter, without any intermixture of earth. When the bog is shallow, the residuum produced by burning consists of red or yellow ashes, varying in weight from one-twelfth to one-eighth of the original weight. In deep bogs, the ashes produced by burning the surface are usually light and white, and do not exceed one-eighteenth part of the original weight of the bog. They are pronounced as of little value for manure, and peat soils are to be considered valuable in proportion to the production of red or yellow ashes.

Such is the classification of soils adopted on the general valuation of Ireland. They are accompanied by explanatory terms, directed to be used in the field book in describing the different varieties.

The following are the definitions of these terms: *Stiff*—soils containing a large proportion, say one-half or more, of tenacious clay: they crack in dry weather, and form large and hard clods when ploughed in wet weather. *Friable*—the soil is loose and open. *Strong*—the soil contains a considerable proportion (how much?) of clay, and has some tendency to form clods. *Deep*—soils exceeding ten inches. *Shallow*—less than 8 inches. *Dry*—the soil is friable, the subsoil porous; there are no springs. *Wet*—the soil and subsoil are both tenacious, or springs are numerous. *Sharp*—a moderate proportion (undefined) of gravel or small stones. *Fine, or soft*—there is no gravel, but the soil consists chiefly of very fine sand or soft light earth. *Cold*—the soil rests on a tenacious clay, and has a tendency, when in pasture, to produce rushes and aquatic plants. *Worn*—soils which have been run out with hard cropping. *Poor*—land of naturally bad quality. *Hungry*—soils containing a considerable proportion of gravel or coarse sand, resting on a gravelly subsoil; manure produces little effect on them.

The colours of soils, as brown, yellow, black, red, are also to be introduced into the field book; as well as, where applicable, the words steep, level, shrubby, rocky, exposed.

The valuers are directed to divide soils, with reference to their value, into five classes. A, prime land; B, medium land; C, poor, or clayey, or shallow, or strong arable; D, cultivated moors or bogs; E, natural pastures or bogs.

*Prime* soils are sub-divided into—A 1, superior arable, strong, deep, rich, either alluvial or upland, and clear of waste springs or other imperfections; A 2, the same, intermixed with spots of wet or moory land, which have been deducted and valued at a lower price; A 3, superior arable, not so strong or deep as the foregoing, or rather steep or exposed.

*Medium* soils, B, are divided into—B 1, good medium soils, or inferior alluvial land of an even quality; B 2, the same mixed with moory or light hilly spots, deducted into the valuation; B 3, medium land of even quality, but rather steep, rocky, or exposed to injurious winds.

*Poor* land, C—C 1, rather shallow, cold, mixed, or steep; inferior land; C 2, cold, or shallow, or gravelly, or mixed, or steep, or poor, or worn land; bad land, C 3, very shallow, or wet, or cold, or worn, or sandy soils, with porous subsoil, or high, or steep, or very strong (very bad land).

Cultivated moors or bogs, D, are thus sub-divided—D 1, a good moory soil, well drained on good subsoil; D 2, medium moory soil, well drained, and in good condition; D 3, poor moory bog, or arable, wet or unmixed with earth.

*Natural pastures*—E 1, green, shrubby, or rocky, or steep lowland pasture, green pasturable mountain, with spots of rocks or heath interspersed; E 2, good heathy mountain, with green pasture through the heath; E 3, good heathy pasture, with spots of green pasture intermixed; E 4, heathy pasture, high and remote, or cut-away bog, partly pasturable; E 5, red bog, or coarse, high, remote mountain.

The letters affixed to the different qualities and values of soils are intended to guide the valuers on selecting the proper class for each soil; they are not, however, entered on the map, or in the field book. Instead of this, a full and clear description is given, so as to be easily understood by any person who may have occasion to read it; it is written in the book against each lot.

With regard to local circumstances affecting the value of land, the commissioner directed that all lands should be valued as if in an ordinary situation; and that per-centage, additions, or deductions should be made for deviations from that ordinary value as the case may require.

Land in an ordinary situation is defined to be all varieties of land which may be considered on a medium situation—that is, from three to five miles from a principal market town, having a fair road to market, not particularly sheltered or exposed; not very conveniently situated with respect to fuel, lime, or other manures; not remarkably level or hilly, and whose greatest elevation above the sea does not exceed three hundred feet. Deductions from this value are for greater elevation, for steepness, exposure to injurious winds, different varieties of soil in small patches in the same field, bad fences, and ill-shaped fields, and, lastly, bad roads. Additions are to be made for greater vicinity to limestone quarries, to sea manure, or turbary; for good roads, for goodness of climate, including shelter from injurious winds, and, above all, vicinity to cities and towns.

It has been asserted that a landowner, well known in the agricultural world, declared he could let his land by a geological map which showed nothing but the rock formations, and excluded the superficial deposits. If this was the case, his estates must have been peculiarly circumstanced. If there are many who, misled by such authority, have adopted this opinion, they would do well to bear in mind one fact connected with the general valuation of Ireland, namely, that the Commissioner of Valuation is an eminent geologist, and that he has made no such attempt. He has now some companions in Ireland in that field of research, but he long stood alone as *the* Irish geologist. He constructed the first geological map of Ireland, just as Smith constructed the first of Eng-

land and Wales. He has laid down extensive areas as occupied by the different varieties of unstratified and stratified rocks. There are the districts of granite, of mica-slate, and basalt. There are the districts of Silurian slates, old red sandstone, carboniferous limestone, and coal measures; but not one word can we find, in the instructions to the valuers, about regulating the value of land by the formations, or by the geological map of the Commissioner. Ireland, like England, is extensively overspread with the superficial deposits. From the great extent of that unbroken sheet of carboniferous limestone which occupies all the central parts of the island, the influence of the superficial deposits on the soil ought to be less than in England, because the effect of the transporting agencies which produced them would merely be to drift fragments of limestone from the north over the southern portion of the great limestone district. In England, where there is no such large unbroken area of one rock, the rock formations should exercise a greater influence on the soil, and they define the agricultural character of a district to a certain extent; this, however, is only whilst we confine ourselves to general views. The moment we enter into details that character becomes so modified by the superficial deposits, that on every rock, or group of rocks, designated by one colour on an agricultural map, a great variety of soils are found, of very different composition, and of very different values.

The points to which the valuers in Ireland have been directed by a geologist to direct their attention belong rather to the geology of the surface than to that of the substrata. They are directed to ascertain, by digging, the depth and composition, and the nature of the subsoil, whether porous or retentive, and the only geological characters noticed in the rocks are whether they are argillaceous, calcareous, or siliceous, without reference to the part of the series to which they belong. Besides these conditions which affect the quantity of the produce, there are others which affect its value when raised, such as vicinity and accessibility of markets.

It has been found necessary to direct the valuers to discard from their minds, in the first instance, the standard prices of the Act, and to value the land as if they were acting for a liberal landlord about to let it to solvent tenants on a lease, say for twenty-one years, at the current prices. The adjustment of this value to the standard scale is a subsequent operation. That scale was founded on the average prices of agricultural produce throughout the principal maritime markets of Ireland during a period when prices were low. In an explanation of the system, drawn up by the commissioner in 1844, it is stated, that at that time the act prices were found to be one-eighth, or 2s. 6d. in the pound below the



current prices. For this reason, in order to bring the primary valuation to the scale of the Act, 2s. 6d. in the pound is deducted for land in the maritime districts in an ordinary situation, that is, for land within eight miles of a good market and seaport. On the other hand, an addition of 1s. in the pound is made as the distance diminishes, on account of superior advantages of situation, arising from facilities for procuring manure and vicinity to markets. At a distance of only four miles 1s. in the pound is added; and this addition becomes proportionally greater as the town is approached, the addition being 8s. 6d. in the pound within two miles, 14s. in the pound at one mile, 26s. in the pound at half a mile, and 40s. in the pound for gardens close to the town: so that land which in an ordinary situation as to distance would have been valued at 20s. the statute acre, is raised to 60s. when close to a maritime town of, say 70,000 inhabitants. Additions, though on a more moderate scale, are made as smaller towns and villages are approached, according to principles and tables, for distance and population, drawn-up to assist, but not absolutely to limit, the judgment of the valuers.

For land in the interior larger deductions are made in the first instance, in order to adjust the primary valuation to the Act prices, than in the maritime districts. Prices in the former have been found to be generally from 1s. to 1s. 6d. in the pound lower than in the latter. Therefore, where 2s. 6d. in the pound would be deducted under this head in the maritime districts, 4s. in the pound would be deducted for land in an ordinary situation, as to elevation and exposure and distance—say, about four miles from a market-town in the interior. Deductions varying from 2s. to 5s. in the pound, and, in some cases, as much as 10s. are made for unfavourable conditions of exposure and elevation.

But one of the most important circumstances affecting the local value of land is, the state of agriculture in different districts. The groundwork of the primary valuation is the gross value of the estimated produce according to the system of cultivation which prevails in the neighbourhood. In this respect, considerable variations are observed in different districts, although the prices of agricultural produce may be nearly the same. The produce, for instance, of 100 acres of land, as cultivated by ordinary farmers, in the counties of Roscommon, Mayo, and Galway, is less, by about fifty per cent., than the value of produce raised from soils of similar quality and depth (the italics are Mr. Griffith's) as farmed in the counties

of Down, Armagh, and Antrim; and hence, though the local prices of agricultural produce do not differ more than seven or eight per cent. between the western and the eastern counties, the value of land varies fully one-half, owing to the difference in the established methods of cultivation. Nevertheless, the farmers of the western counties—that is the worst farmers—who pay 20s. an acre for their land, are not nearly so well off as those of the eastern counties, who pay 30s. per acre for land of similar quality and general circumstances.

The value set upon land, under this general valuation, is proportioned to the value of the produce, according to the following scale:—

Description.	Value per Stat. acre.	Proportion of produce.	Usual proportion where land is let high.
Arable . . . . .	20s. to 30s.	$\frac{1}{4}$ . . . . .	$\frac{1}{4}$
Ditto . . . . .	10s. — 20s.	$\frac{1}{4}$ . . . . .	$\frac{1}{4}$
Ditto under. . . . .	10s.	$\frac{1}{4}$ . . . . .	$\frac{1}{4}$
Pasture land . . . . .	20s. — 30s.	$\frac{1}{2}$ . . . . .	$\frac{1}{2}$
Mountain pasture . . . . .		$\frac{1}{2}$ . . . . .	$\frac{1}{2}$

The proportion, says Mr. Griffith, which rent should bear to the produce of *good* arable land has usually been set down, in Scotland, at one-third, and for inferior land at one-fourth; and taking this as the key, it would appear that what I call high rents would be considered as fair, or even moderate, in many parts of Scotland. But we must take into account the imperfect state of agriculture in our most improved districts as compared with the Lothians, Berwickshire, and Roxburghshire; and if the labour be the same, and the produce much less, the rent should be reduced in proportion, to cover the extra cost of production. The same argument is applicable, but in an increased ratio, to poor and undrained land, where agriculture is in a backward state, and accordingly such reductions have been made.

Land of the same quality and circumstances in *the same locality*, though badly farmed, is valued at the same rate as similar land well farmed, clean, and in good order; but all permanent improvements, such as drains, good fences, and good roads, are taken into consideration. Land which is clean, and in a high state of cultivation, may by bad cultivation and hard cropping be deteriorated in a few years. It is therefore considered unjust that in *a permanent valuation for public purposes* land should be rated high, solely on account of its being well cultivated at the time the valuation was made; and, on the other hand, it is considered that land of a good quality which has not run out should not be valued quite so low as its present condition would appear to require.

## THE CORN TRADE OF LIVERPOOL.

"The annual average production of all sorts of corn in the United Kingdom has been estimated, by competent persons, at rather more than 60,000,000 quarters in quantity, and £90,000,000 in value."—*Braithwaite Poole's Statistics of Commerce.*

Ireland produces nearly one-fourth of the entire quantity of corn grown in the United Kingdom, and the annual returns of agricultural produce issued from the office of Public Works in Dublin reflect great credit on those who compile them. It is much to be regretted that Parliament has never authorized similar returns to be made up in England, Scotland, and Wales; such information being of the utmost importance both to our rural and commercial community.

Yet, notwithstanding the proximity of Ireland, we scarcely receive in the port of Liverpool 5 per cent. of the gross agricultural products from the Emerald Isle, our supplies being chiefly obtained from the Baltic and the Black Sea when in bulk, and from the United States and France when in the manufactured state, packed; beside our domestic arrivals, both coastwise and by inland communications, from Lynn, Wisbeach, Ipswich, Yarmouth, Lowestoft, and other little ports on the east coast of England, the Lowlands and west coast of Scotland, and North Wales.

Oats and oatmeal are by much the largest articles of export from Ireland, then follow wheat and wheat-flour; the quantities of all other descriptions of grain being comparatively inconsiderable. The annual average amount, weight, and value of grain, and the produce of grain, imported from Ireland into Liverpool during eight years, as extracted from the last official report to Parliament, appear as follow.—*Vide Commercial Tariff Appendices*, page 196.

Description.	Quantity.	Weight.	Value.
	Qrs., &c.	Tons.	£
Oats, qrs. ....	255,255	36,465	262,608
Oatmeal, loads ....	288,990	30,963	377,230
Wheat, qrs. ....	133,167	26,633	339,022
Flour, loads ....	177,013	22,126	331,182
Barley, qrs. ....	12,553	2,092	19,556
Malt ditto. ....	3,915	489	10,706
Beans ditto. ....	4,595	919	8,574
Peas ditto. ....	402	80	724
Rye ditto. ....	373	75	614
Total.....		119,842	£1,400,216

But these figures represent only about one-fourth of the total annual average imports of grain from all places into the port of Liverpool; and it is difficult to obtain the statistics correctly, because no authentic records exist. The Customs Bill of Entry can only be a partial one, inasmuch as numbers of coasting vessels, laden with corn, are reported as with cargoes of "Sundry British goods," which are, consequently, excluded from

the catalogues of the brokers. Mr. Robert Procter has been in the habit of publishing approximate statements, extracted from the Bill of Entry, and has kindly furnished me with the following synopsis for the twelve months ending 30th September, 1852, of the imports into Liverpool and re-exports therefrom, during this period, viz. :—

TOTAL IMPORTS.			
Wheat, English .....	qrs.	20,030	
Irish.....	"	21,780	
Foreign.....	"	475,799	
Colonial.....	"	31,584	
			Tons.
		549,193	109,838
Flour, English.....	sacks	4,574	
Irish.....	"	33,408	
Foreign.....	"	141,597	
Ditto.....	brls.	930,453	
Colonial.....	"	75,055	
		1,185,087	122,998
Oats, English and Irish .....	qrs.	186,223	
Foreign.....	"	22,431	
		208,654	29,808
Oatmeal, English and Irish....	loads	277,312	29,712
Barley, English and Irish.....	qrs.	35,528	
Foreign.....	"	23,396	
		58,924	11,785
Beans, English and Irish .....	qrs.	13,139	
Foreign.....	"	118,336	
		131,475	26,295
Peas, British.....	qrs.	2,343	
Foreign.....	"	4,911	
		7,254	1,451
Indian Corn, foreign .....	qrs.	211,526	42,305
Indian Cornmeal, foreign.....	brls.	712	142
			374,334
TOTAL EXPORTS.			
Flour.....	brls.	418,655	
Indian Corn .....	qrs.	185,574	
Wheat.....	"	129,264	
Beans.....	"	12,868	
Indian Cornmeal.....	"	8,434	
Barley.....	"	3,939	
Oats.....	"	750	
Peas.....	"	419	109,074
Balance.....			266,260

Strange as it may appear, yet almost the whole of these re-exports were made to Ireland, which has become a corn-importing as well as an exporting country.

According to the *Liverpool Mercantile Gazette*, the following were the imports of corn into Liverpool during the last year, ending 31st December, 1852:—

IMPORTS.					
	From Ireland.	Coastwise.	Europe.	U.States.	Canada
Wheat, qrs. . . . .	4,982	9,410	196,905	371,988	20,879
Oats, " " " " " "	202,567	16,933	22,922	—	—
Barley, " " " " " "	11,148	17,019	20,071	—	—
Beans, " " " " " "	4,563	5,720	116,223	—	—
Peas, " " " " " "	1,369	605	7,675	2,811	6,428
Malt, " " " " " "	4,657	43,698	—	—	—
Meal, loads . . . . .	350,262	2,413	901	117	—
Flour, sacks, &c. . . . .	21,177	1,832	129,279	829,138	51,890
Indian corn, qrs. . . . .	689	—	84,476	120,120	—
I. C. Meal, brls. . . . .	—	—	—	200	—

## TOTALS.

Wheat, quarters . . . . .	604,164	=	120,833 tons.
Oats, " " " " " "	242,422	=	34,632 "
Barley, " " " " " "	48,238	=	9,647 "
Beans, " " " " " "	126,506	=	25,301 "
Peas, " " " " " "	18,888	=	3,778 "
Malt, " " " " " "	48,355	=	6,044 "
Meal, loads . . . . .	353,693	=	37,895 "
Flour, sacks . . . . .	1,033,316	=	103,331 "
Indian Corn, quarters . . . . .	205,285	=	41,057 "
Indian Corn Meal, barrels	200	=	20 "
Total . . . . .			382,538 tons.

Still, even these figures are only an approximation to the absolute imports. The railroad communications from the eastern counties of England having recently become more perfect, large quantities of flour, malt, barley, and other grain, have been brought this way into Liverpool for consumption, which is rather a new feature in the trade, and not comprehended in any return; nor is any of the corn grown in the neighbourhood of Liverpool, and sold to the millers of the district, registered in any way whatever.

A society has, however, just been formed, called, "The Association of the Liverpool Corn Trade," the object of which is to promote measures calculated to benefit it, by more clearly defining what is meant by the usual term "custom of the trade"; by constituting a tribunal of reference, before which disputes may be carried for an amicable adjustment; by adopting measures for reducing the heavy charges attending the landing, warehousing, and shipping of corn, and by collecting correct statistical information.

Owing to the total absence of any ordinary accommodation for the corn trade, Liverpool is probably one of the most neglected seaports by the proper authorities, in this respect, of any in the kingdom. First of all, the vessels on arrival are generally berthed in the refuge for the destitute, stern on to the north or south quays of the George's, Canning, Salthouse, &c., Docks, where there is neither shed nor covering of any description; the owners, or consignees of the corn, send their own long stages and short sack stands, the latter shaped like hour-glasses, from which the most miserable-looking beings imaginable, called corn-porters, run, by relays,

with sacks upon their backs, in the most primitive manner, until the last man reaches the place of deposit—a warehouse.

Compare this mode of doing business with that transacted on the Thames or the Humber, where the vessels unload their cargoes direct into the granaries, and from which the grain can, by means of long shoots, be re-shipped or reloaded into smaller craft, at a very trifling expense. Look at Hull, Goole, Wakefield, and other ports on the east coast, where the railways are laid right into the granaries, as they ought to be, upon the dock quays, enabling the corn-merchants there to forward their grain westward into the manufacturing districts at the smallest reasonable cost for such portorage and other charges.

Then, why should Liverpool remain so backward? Why are not arrangements made for convenient granaries to be erected on the east side of the new Wapping Docks, and connected with the London and North-western Railway? Even the existing traffic would fully justify such proceeding, as the entire trade, if properly summed up, there is very little doubt, amounts to an average of 10,000 tons in weight weekly, equivalent to £5,000,000 in value annually.

This extensive and important business is carried on by upwards of 100 brokers and factors, denominated corn-merchants, the most of whom make advances on receipts of a bill of lading to the extent of two-thirds or more of the ordinary marketable value of the corn, and sell it generally soon after arrival, either on speculation or to the millers in the neighbourhood: it being estimated that nearly one-third of the whole remains for consumption in the town of Liverpool; above one-third is forwarded into the adjacent manufacturing districts; and one-third is re-exported.

The chief markets wherein sales are effected from Liverpool are those of Manchester, Preston, Blackburn, Warrington, Bolton, &c. Occasionally small lots of grain, and large lots of barrel flour, are sent into Staffordshire and Warwickshire, and the latter have even been sent as far as London by railway. But to supply those markets from Liverpool is an exceptional case, and not the general rule; as they are principally supplied from the eastern counties of England and imports into the port of London.

No extensive branch of commerce at this great port is carried on in so loose a manner, and at so great an expense, as the corn trade. The charges for portorage, turning, and cartage, are greater, perhaps, on an average, than at any other seaport, with the exception of London.

The following table shows, at a glance, the comparative average expenses, which, independent of duty and commission (which are fixed charges), an importer into each port incurs, when his produce is sold, ex ship, and when warehoused, held three months, and then sold and delivered.

In the Seaports of	Wheat, per qr.		Barley, per qr.		Beans and Peas, per qr.		Oats, per qr.		Flour, per ton of 8sks or 11 brls.					
	If sold ex ship.		If warehoused three months.		If sold ex ship.		If warehoused three months.		If sold ex ship.		If warehoused three months.		If sold ex ship.	
	d.	s. d.	d.	s. d.	d.	s. d.	d.	s. d.	d.	s. d.	d.	s. d.	d.	s. d.
Liverpool	9	10	7	1	7	7	6	1	7	5	0	1	0	
London	6	2	6	6	6	6	6	1	10	8	0	10	6	
Dublin	6	1	6	6	1	6	6	1	6	4	6	8	0	
Hull	6	1	6	6	1	3	6	1	3	2	6	5	9	
Glasgow	7	1	5	5	4	4	6	1	4	3	8	8	0	
Leith	5	1	4	5	4	4	4	1	4	3	2	0	5	0
Newcastle	6	1	6	5	1	5	5	1	4	2	4	7	6	
Bristol	5	1	6	5	1	5	5	1	4	2	6	6	6	
Gloucester	7	1	4	6	1	4	7	1	4	4	0	5	9	

These details, furnished to me by a good authority, Mr. Joseph Hubback, exhibit strongly the necessity of a full representation being forthwith made by the new association to the trustees of the Liverpool Dock Estate of the wants of the corn trade, with a view of obtaining the requisite accommodation.

Great changes have recently taken place with respect to the importation of foreign sack flour, vessels having been, and are now, sent from France and Spain to Falmouth and the Cove of Cork, there to wait orders, and take advantage of either Liverpool or London markets. The sacks are of very irregular sizes, varying from 140 to 280lbs.

The mode of selling corn in Liverpool is different from that of London and many other places, as follows:—

Wheat	per bushel of	70lbs.
Oats	"	45lbs.
Rye	"	60lbs.
Barley, grinding	"	60lbs.
Ditto, malting	per imp. qr.	
Malt	"	"
Flour	per barrel of	196lbs.
Ditto	" pack	240lbs.
Ditto	" sack	280lbs.
Oatmeal	" load	240lbs.
Indian Meal	" pack	240lbs.
Ditto	" barrel	196lbs.
Indian Corn	" quarter	480lbs.
Beans and Peas	"	480lbs.
Ditto	"	504lbs.

In fact, different customs exist in different towns, and it is a pity that one uniform weight is not adopted for everything sold in all agricultural markets.

The extent and value of the corn trade of Liverpool from the year 1830 to the year 1851, may be seen on reference to Baines's "History of Liverpool," p. 821. At Runcorn and Ellesmere port, large supplies of corn and flour are received direct from Ireland, for transmission to the interior of the country; and Garston Dock, when completed next year, will be a similar transshipping point; and when the enlargement of the Liverpool Corn Exchange, now in course of progress, is finished, it will be the handsomest building of the kind in Great Britain.

Liverpool, May 12.

B. P.

THE FARMERS' FRIEND.

That somewhat curious character "the Farmers' Friend," though not perhaps so often heard of just now as he was wont to be, is still gradually assuming more definite shape and form. The well-rounded sentence in which he once clouded his intentions is no longer his grand argument. The vague hopes and aspirations that told plainly enough he scarcely knew what he was going to do, or what his audience expected of him, is becoming reduced to something more tangible. We are condescending at last to go into detail, and to ponder seriously over what it is necessary to accomplish—providing only we are allowed the means with which to accomplish it.

And here the farmers' friends separate themselves into two classes: one division, who proclaim to us with all-sufficient energy what it is necessary to do; the other, who talk, though not always so loudly, of what they want to do this with. The former of these are the theorists who preach practice—a rapidly increasing body by the way—it appearing to be a generally admitted fact that anyone can teach farming but the farmer himself. However, the gentleman who takes to the occupation comparatively late in

life, and most frequently with all that ardour which we are told so commonly characterizes "the new loves" of maturity—this one of the farmer's friends we honestly believe devotes himself to the pursuit with the best intentions. There is no jealousy to mark his proceedings; if anything, indeed, he is only too anxious to let others know how well he is succeeding; and only disappointed when they do not at once follow his example. He is amusingly business-like and practical in everything he undertakes. It is the duty of himself and his brother-farmers to farm well—here is the Alpha and Omega of his ambition and his instruction. Plenty of capital, plenty of manure, plenty of labour—all of the best sort, and of course all at the best price. This to begin with; and then let your swedes swell in size, your cabbages spread in leaf, your buildings increase in accommodation—and so on. This is the farmer's friend, who can go a-head, simply because his existence—"the means whereby he earns his bread"—does not depend on his success in this go-a-head career. From these we have all to learn, as a well-known agriculturist quaintly remarked in addressing a body of farmers in the north:

"Gentlemen," said he, "I shall not attempt to tell you anything about the merely practical part of our business, although it is said you have a good deal to learn yet. If you will only walk into some of our friends' shops here, I have no doubt they can tell you a good deal more about it than ever I could."

We have no wish to undervalue the services of such enthusiasts; though when insisting on the common adoption of their practical improvements, they too often jump at conclusions essentially impractical—at least under the present state of circumstances. Like the little lady who wondered people should starve when there were buns to be had for a penny a-piece, they cannot understand why everybody has not land on the best tenure, in the best condition, and with every encouragement to make the best of it. They assume a foundation which is an exception rather than a rule, and then proceed to build up a structure, the very basis of which is as yet anything but completed. Still, this farmers' friend—the theorist who preaches practice—does good in his generation. Example has often a double duty, and we may learn from it to avoid quite as easily as to imitate.

Our other Farmers' Friend promises, we think, to be far more useful, providing only he will play his part as spiritedly as the one we have just sketched. We take him to be better acquainted with the case, and to have more real sympathy with the wants of those he advocates. This farmers' friend, in a word, is, or ought to be, the farmer himself. Step by step are the farmers coming to view their position in its true light, and to see how much depends upon their own exertions. We say this as the looming of a general, quite as much as of an individual effort. Where theory takes one grand point for granted, practice puts its case on the assumption of another. We will assume it is admitted that the cultivators of the soil know their own business—that they are keenly alive to the improvements in progress—that they have advanced considerably of late years: all this is easy of proof, and, we will proceed to say, they would go much further were there only a fair opportunity allowed for their doing so. The farmer then looks at the basis of the structure as the first consideration. Only clear the path for him, and he will follow it out. From the reports of various agricultural meetings we may gather there must be something radically wrong at the bottom still; many a serious impediment yet to be removed before we can take our fair share in that "progress" the world calls so loudly for. "I don't want to know how to grow turnips, or feed cattle," said the representative of a local farmers' club the other day; "what I want to know is, how I am to get rid of

those burdens which prevent me growing and feeding them as I could wish. That's what we ought to go for, in the first place."

And this, beyond a doubt, is what they must go for, before they can feel themselves properly "righted," or in a position to start fair under that new system they have now to submit to. The recognition of this said system is, at least, attended with the one advantage—that it has served to remove much of that false delicacy which so long prevented farmers speaking out on their own condition. Other classes might press their wants on the attention of the Legislature, but the "No Politics" cry we alluded to a few weeks since was the bar here. It would appear to be such no longer. From a circular notice sent us we find that on Saturday next the following subject will be brought before the members of the Winchester Farmers' Club:—"The Advantages arising to Agriculturists generally from Political Discussions at Farmers' Clubs."

This certainly reads bold enough, but we have no wish to quarrel with the wording of it. It is evident that to effect anything, farmers must discuss *farmers' politics*—always, as we hope, with that temper and discretion which will command respect while they ensure attention. The "Winchester" is now one of the most active of the local clubs; and numbering, as it does, many very able men among its members, we shall watch with more than ordinary interest the result of the meeting in question.

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**CULTIVATION OF WATER-CRESS ON DRY LAND.**—It is not generally known that this universally esteemed addition to the essentials of the breakfast-table, for which we are in the habit of paying daily pence which, in the course of time, amount to a considerable sum, to itinerant vendors, may be grown by any one who can command a few yards of earth in a situation not fully exposed to the sun. A few plants may be procured from any of their natural habitats, and placed in the ground, where they will soon begin to grow. Of course it is absolutely necessary to keep the new plantation perfectly shaded for a time, and if it can be always thus kept all the better. Plentiful supplies of water at all times when rain is not abundant are also essential; but it is a mere fancy to suppose that a running stream is wanted. The plant may grow better in such a situation—probably it does; but that it is not necessary I have had the fullest proof, having seen water-cresses as luxuriant, or nearly so, as any that could be gathered in ditches and brooks, grown on a damp, shady border in a kitchen-garden. Perhaps they were not quite so tender and delicate, but still their quality was such as to leave no room for complaint.—VIATOR.

## ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A WEEKLY COUNCIL was held at the Society's House, in Hanover-square, on Wednesday, the 27th April; present, Lord Ashburton, President, in the chair; Lord Berners, Hon. R. H. Clive, M.P., Sir John V. B. Johnstone, Bart., M.P., Sir Montague Cholmeley, Bart., Mr. Raymond Barker, Mr. H. Raymond Barker, Mr. Bermingham, Mr. Bullen, Mr. D. Barton, Jun., Rev. Thomas Cator, Colonel Challoner, Mr. Capel Cure, Mr. Dyer, Mr. Fisher Hobbs, Mr. Hyett, Mr. Majendie, Mr. Manning, M. J. Chalmers Morton, Mr. Paget (Ruddington Grange), Mr. Paine, Mr. Parkins, Mr. Pocock, Professor Simonds, Mr. Slaney, Mr. Reynolds Solly, Mr. Spencer Stanhope, Mr. Crompton Stansfield, Captain Henry Vyner, Professor Way, and Mr. H. W. White.

COTTAGERS' WELLS AND PUMPS.—Mr. Slaney, of Walford Manor, Salop, favoured the Council with the results of his experience in obtaining convenient supplies of water for labourers' cottages, by very simple and inexpensive, but effective means; to the adoption of which he had been led by becoming acquainted, during his connection with successive sanitary commissions, with the absolute necessity of an adequate supply of water to the poor, within a moderate distance from their homes. In some parts of that county such supply was very indifferent, the cottages being far off from any well, and the labourers having to go half a mile to a surface spring: the consequence was, that they had to carry the water to their houses day after day, with much trouble and loss of time. The cost and cartage of bricks, and the labour attending the construction of large draw-wells of four feet in diameter, were obstacles alike to the large and small farmers, that prevented such works being carried out beyond certain limits, and executed in those positions where only small supplies were required by the isolated cottager. Dr. Johnson had remarked, that whatever was done with trouble was seldom done at all. Mr. Slaney, therefore, hoped that all persons who had by experience ascertained simple and economical means for promoting the convenience and improving the condition of the labouring poor, would, like himself on that occasion, venture to communicate their results, which would then, by adoption, be rendered still further practicable and advantageous to that deserving class. In many of these cases only small supplies of water were required at once; and the springs, though only shallow, had a sufficient interval of time allowed them to regain their level. There were also many soils, not containing stones or beds of rock, which were easily cut into, and also at moderate depths yielded the supplies of water thus required; such soils were those of a sandy, marly, clayey, or gravelly character; and into these, wells might be sunk to a depth varying from three to seven or eight

yards, at points conveniently situated for one or two cottages, at a sum (including every expense of the pump and the sinking of the well) not exceeding from £3 10s. to £5. Mr. Slaney explained to the members, that the spot for the well being selected, and a small circular space dug round as a preliminary process into the ground, the sinking of the well itself was commenced by making a vertical opening a few feet deep by means of the ordinary boring auger, or cylindrical scoop, three inches in diameter, which not only penetrated the ground, but brought up the soil which it detached and enclosed. An iron cylinder, half-an-inch thick in metal, five inches clear in its internal diameter, and four feet in length, having its lower circular end brought to a sharp bevelled edge, to penetrate the ground, and a collar or rim of wood, cordage, or some other soft substance, fixed over its upper end to prevent vibration, was then placed over the opening thus made, and driven down into the ground by means of a heavy wooden mallet. The auger was again employed to remove all the earth enclosed by this iron cylinder; and, in order to obtain a further downward-passage for the cylinder, a tool was used to loosen and clear away the earth from beneath its cutting rim: this consisted of a rod with a cross-handle at its top, and a projecting claw fixed at a right-angle to its lower end; so that on turning this tool round by its handle, the claw turned also round, beneath and beyond the sharp edge of the cylinder, which was again beat down by the mallet and the earth removed by the auger. The requisite number of successive cylinders were placed one upon the other, and beaten down as the lower one descended. The well in this manner was generally completed in a single day, provided all the preparations for it had been duly made; and its sides were encased from top to bottom by the iron cylinders in question. The bottom of the well was formed of a bed of gravel, shot down when the water began to come to the depth of a foot, and which acted as a filter for the ascending water: and the lowest iron cylinder having a portion of its sides pierced with small holes to admit a lateral supply from the surrounding ground. The pump, with its spout turned down and covered with a grating, and its leaden pipe of half-inch to an inch bore, supplied to Mr. Slaney by Caswell, of Snow Hill, Wolverhampton, were then inserted, and the well-top covered over as usual; the lower end of the leaden pipe, of globular shape, and pierced with holes, being let down into the water immediately above the bed of gravel. Mr. Slaney had found the expense of such well and pump, about seven yards in depth, not to exceed from £3 to £5; and he understood that in cases where a greater number were contracted for, the expense might be still less. He thought it would be

evident to the members that pumps of this nature, with the implements and cylinders for forming the wells in question, could easily be conveyed in a cart at very small expense; and although he felt great confidence in the success of the form of well he had then ventured to describe, he made the communication in the hope that such improvements might be suggested in its form and structure as would tend to its still further economical manufacture and convenient adaptation to its purpose. Mr. Slaney then referred to the conducting of water from springs on higher grounds to lower positions by means of tubular drain tiles. He also referred to the great importance of draining well the site on which a cottage is to be built, in order that the soil may have the moisture well drawn out of it: this he thought particularly advisable in the case of clay lands, the walls of the houses on which continued for a long time to exude moisture, or sweat damp: red sandstone as a building material being also liable to produce this effect. This exudation, he remarked, might easily be prevented, by inserting a slate above the first or second course of masonry, and slanting a little beyond it, which cut off the communication between the walls and the foundations, and prevented the dampness from ascending. He also alluded to the glazed tubes recommended by the Climbing-boys Commission, in the construction of chimneys, as leading to less accumulation of soot, and effecting a better draught and consequent ventilation. He also called the attention of the members to a simple air-flue, which might at no expense be made in the building of cottages at the back of the kitchen-fire, by means of which warm air might be circulated through the adjoining apartment, where clothes might be dried, and also through the floors to the upper rooms of the house. He concluded by hoping that these suggestions would be received by the Council without disfavour, and that they would tend, on further improvement, to that convenience and comfort to the poorer classes in which the community generally were all interested.—Lord Ashburton explained the advantages and construction of the cheap clay ovens used in Devonshire.—Colonel Challoner thanked Mr. Slaney for the information he had given them, every point connected with cottage economy being well deserving of attention. He had himself found his plumber's bills so heavy every six months for the repairs of his pump suckers, that he had been induced to try the cheap cast-iron pumps made by Messrs. Warner; and since he had adopted them, he had not had a sixpence to pay for repairs, the double action in the handle keeping the sucker constantly in a vertical position, and preventing its wearing out. He feared the lead pipe of Mr. Slaney's pump would corrode. He referred to instances in which he had known the lead become furred and eaten away in a few months. He had found galvanized iron pipe at about 2s. a yard the best for the purpose of conveying water. He fully concurred with Mr. Slaney in the importance of the foundations of cottages being thoroughly dry. The late estimable Marquis of Downshire, one of their trustees,

being anxious on one occasion to erect a double cottage in Ireland on a clay flat, where there had been no drainage, consulted Colonel Challoner on the subject of the site, when he advised his lordship not to sink foundations, but to place the cottages on a raised truncated pyramid of dry earth brought to the place, two feet six inches high, with sloping sides; and Lord Downshire had told him, a little before his death, that no cottages on his estates were so dry as those in question.—Mr. Hyett thought the use of iron a great objection in pumps or conduits; he had himself been obliged to remove some iron pumps, in consequence of the corrosion of the metal, and so great an impregnation of the water as to occasion iron-moulds on the clothes washed in it. Probably Mr. Slaney had that result in view when he adopted lead as the metal for his pipes.—Mr. Slaney replied that, in the small wells and pumps to which he had referred, the water was constantly removed, and not allowed to remain stagnant sufficiently long to act upon the metal. He had not heard of any complaint of such impregnation in his pump-water, which was not used by the cottagers for washing, a pit or pond being generally at hand, where there was a collection of soft water. The leaden pipes in his well admitted of being at any time easily drawn up and examined.—Professor Way had understood that the plan of Dr. Smith, of Manchester, had been adopted in many towns in Lancashire for coating iron. The tubes were made red hot, and then dipped into a liquid bituminous mixture, which gave them a strong and beautiful coating of japan. With regard to metallic corrosion in general, it might be stated that much of the effect depended upon the particular kind of water and the chemical agents it held in solution.—Lord Ashburton thought the friction of the borer would wear away the internal varnish of the tube, but that such bituminous coatings would be found very effective in the case of pipes for simply retaining or conducting water.—Mr. Stansfield considered that the Council were much obliged to Mr. Slaney for the statements he had then made to them. The late Mr. Gott, of Leeds, had made wells 400 feet deep, and inserted cylinders of five or six feet diameter, to intercept the land-springs. Iron destroyed all the good quality of water for domestic purposes. He had employed it in some cases; the water however came out a stream of red liquid, of a very injurious nature to plants. Several trials had been made by the York and Leeds Water Companies and others, of lining the pipes, and also of correcting the quality of the water by means of lime; but these means were only of temporary benefit. Every blacksmith knew how to varnish his iron work with the gas tar in the hot coals of his fire; but that protective covering soon wore off.—Mr. Hyett remarked that the pipes in artesian wells were always made of iron. The contamination of that metal only interfered with washing clothes, while dissolved lead interfered with the cooking purposes of water. Mr. Mainwaring Paine had applied the drainage-water from a few fields, to supply the wants of a village lying upon another geological formation, at a very trifling cost to

himself. The village contained about 60 or 70 houses. The drained land lay upon the gault subsoil. The site of the village was porous green sand, and the inhabitants had to fetch water from the river, a distance of from half a mile to a mile from their dwelling houses. Common drainage pipes were laid from the exits of the drains to the valley; and three small wells, from 8 to 10 feet deep, were dug, into which the pipes emptied themselves. This simple plan, Mr. Paine remarked, had given the whole village a plentiful supply of good soft water; and the whole cost to himself had been less than £20, while the villagers considered this supply of good water as a very great boon to them.

Mr. Paget and Professor Simonds communicated information connected with the inoculatory process carried on in this country and abroad, with a view to subdue the virulence of the symptoms of cattle labouring under pleuro-pneumonia, in reference to the complete report on this subject, in preparation for immediate publication in the Society's Journal. Mr. Bailey Denton's plan of model mapping, and Mr. Dumolo's paper on swamp drainage, were referred for consideration to the weekly council on the 25th of May.

The Council then ordered their usual acknowledgments for the communications then made to them, and adjourned to their monthly meeting on the 4th of May.

A MONTHLY COUNCIL was held at the Society's house, in Hanover Square, on Wednesday, the 4th of May. The following members of Council and Governors of the Society were present:—Lord Ashburton, President, in the chair. Earl of Yarborough; Lord Southampton; Lord Bridport; Hon. R. H. Clive, M.P.; Sir Matthew White Ridley, Bart.; Sir Charles Lemon, Bart., M.P.; Sir John V. B. Johnstone, Bart., M.P.; Sir Robert Price, Bart., M.P.; Mr. Raymond Barker, Mr. C. Barnett, Mr. S. Bennett, Mr. H. Blanshard, Mr. Brandreth, Mr. Burke, Mr. W. G. Cavendish, Colonel Challoner, Mr. Crosskill, Mr. Evelyn Denison (M.P.), Mr. Druce, Mr. Gadesden, Mr. Garrett, Mr. Brandreth Gibbs, Mr. Grantham, Mr. Hamond, Mr. Fisher Hobbs, Mr. Hornsby, Mr. Hudson (Castleacre), Mr. Kinder, Mr. Lawes, Mr. C. Lawrence, Mr. Milward, Mr. Mainwaring Paine, Mr. Sillifant, Mr. Simpson, Mr. Slaney, Mr. Crompton Stansfield, Mr. C. Hampden Turner, Mr. Turner (Barton), Captain Henry Vyner, Professor Way, Mr. Jonas Webb, Mr. Wilson (Stowlangtoft), and Mr. Woodward.

FINANCES.—Mr. Raymond Barker presented to the Council the monthly report of the Finance Committee, and the usual quarterly statements of the accounts of the Society, from which it appeared that the general current cash-balance in the hands of the bankers was £3,300. This balance included the Gloucester subscription, and £800 as the special balance on account of life-compositions. The Council adopted the recommendation of the committee that this special balance should be invested as permanent capital in the purchase

of stock in the public funds. The Council also adopted the recommendation of the committee, that the directors of the county of Gloucester bank should be requested to act as the local bankers of the Society during the period of its ensuing country meeting.

LINCOLN MEETING.—Mr. Raymond Barker, Mr. Brandreth, Mr. Fisher Hobbs, Mr. Milward, and Mr. Brandreth Gibbs, having been appointed by the Council at the last Monthly Meeting to act as an Inspection Committee for personally visiting the sites and accommodations offered to the Society for the purposes of the country meeting of next year, the report of this committee was read, and the various localities exhibited to the members on a large map and plans of the city of Lincoln and its vicinity, furnished by the authorities. The Right Worshipful the Mayor and the Town-Clerk of Lincoln, accompanied by the Hon. A. Leslie Melville, and Mr. Torr, the well-known agriculturist of that district, then appeared before the Council as a deputation representing the authorities of the city, and the gentry and farmers of the county of Lincoln, for the purpose of advocating the claims of that part of England for the country meeting of the Society; and the Earl of Yarborough, as President of the North Lincolnshire Agricultural Society, supported the memorial sent in by that body, strongly recommending such choice to be made by the Council. These gentlemen respectively having furnished to the members present every information required of them, they received from the President the best acknowledgments of the Council for the kind trouble they had taken in attending the meeting of that day. It was then resolved unanimously, on the motion of Mr. Raymond Barker, seconded by Mr. Fisher Hobbs, that the City of Lincoln should be the place of the country meeting of the Society for the year 1854; subject to the standing condition, that in the course of a fortnight from that day, the Mayor, on the part of the authorities of that city, should enter into the usual agreement with the Secretary of the Society, acting in the name and on the behalf of the Council under the powers of the Royal Charter, that the offers and stipulations on which the decision of the Council had been made should be guaranteed under their hands respectively, and the seals of their respective corporations.

COUNTRY MEETING OF 1857.—The Council then proceeded, according to established regulation, to determine the district for the country meeting to be held four years in advance; and decided, on the motion of Colonel Challoner, seconded by Mr. Milward, that such district should be formed of the counties of Dorset, Somerset, Wilts, and Hants.

JOURNAL.—Mr. Pusey, Chairman of the Journal Committee, reported that, should no unforeseen impediments arise to retard the publication of the number of the Journal now in the press, it would make its appearance early in June.

STEWARD OF IMPLEMENTS.—On the motion of Mr. Hamond, seconded by Mr. Brandreth Gibbs, Mr. William George Cavendish, of Burlington House, Picca-



dilly, was appointed the Steward-elect of Implements at the Gloucester Meeting.

**JUDGES.**—The Council decided that nominations by members of the Society, made for Judges of Stock and Implements for the Gloucester Meeting, should be received up to the 23rd inst., the day of the general meeting; and the whole list then printed for the inspection and remarks of any member of the Society, who should make application to the secretary for a copy of that list: the selection and appointment of such judges being made by the Council at their Monthly Meeting on the 1st of June—no exhibitor, however, of stock or implements being allowed to vote.

**GLOUCESTER MEETING.**—Mr. Raymond Barker, Vice-Chairman of the General Gloucester Committee, reported the favourable progress of the works for the ensuing country meeting, and a recommendation that Wednesday, the 13th of July, should be the day on which the Pavilion Dinner of the Society should take place.

**GENERATION OF STEAM.**—Colonel Challoner, Chairman of the Implement Committee, reported the active measures taken by the committee for the construction of a steam-boiler for supplying steam to work the fixed engines at the Gloucester Meeting; and their full expectation that each boiler would be completed in due time to the satisfaction of the committee, and to that of the consulting-engineer of the Society.

**HOUSE-LIST.**—The Council, in pursuance of the terms of the bye-laws, agreed to the House-List of Council to be recommended to the members at their ensuing general meeting.

The President laid before the Council a letter addressed to his lordship by the Earl of Clarendon, enclosing a communication from his Excellency the Count Walewski, on the subject of the great exhibition of agricultural and industrial products to be held in Paris, in May, 1855. A communication was also received from Sweden, announcing that the great agricultural meeting of that kingdom would be held on the 15th of August next, at Lidköping, and inviting members of the Society to attend on the occasion, when guides, interpreters, and every other facility would be afforded for their convenience and accommodation.

The Council adjourned to their weekly meeting on Wednesday, the 11th instant, when Professor Way would deliver his lecture to the governors and members, on the chemical constitution of agricultural Grasses.

A WEEKLY COUNCIL was held at the Society's House in Hanover Square, on Wednesday, the 11th of May. Present: Colonel Challoner, Trustee, in the chair; Lord Camoys, Lord Bridport, Sir Matthew White Ridley, Bart., Sir Charles Lemon, Bart., M.P., Mr. Raymond Barker, Mr. Birmingham, Mr. Bullen, Mr. D. Burton, jun., Mr. Cavendish, Mr. Clarke (Swakelys), Mr. John Clutton, Mr. Darnbrough, Dr. Daubeny, Mr. Dyer, Mr. Edgington, Mr. Edwards, Mr. Gadesden, Mr. Brandreth Gibbs, Mr. Fisher Hobbs, Mr. Lawes Majendie, Mr. Manning, Mr. Dyce Nicol,

Mr. Odams, Mr. Parkins, Mr. Ramsay, Mr. Rowlandson, Mr. Severn, Professor Simonds, Mr. Slaney, Mr. Spencer Stanhope, Mr. Crompton Stansfield, Mr. Martin Sutton, Mr. R. Trench, Mr. Tunno, Captain Henry Vyner, and Professor Way.

**NATURAL AND ARTIFICIAL GRASSES.**—Professor Way, consulting chemist of the Society, submitted to the inspection of the members the tabular results he had obtained, during the last three years, from his chemical investigation into the relative nutritive value of the natural and artificial Grasses. These results were given in two tables, one of which contained 20 analyses of natural Grasses, and the other 13 analyses of artificial Grasses, and 7 analyses of weeds; showing the proportion of water in the fresh plant, and the relation of each Grass in its dried and undried state to albuminous and fatty matter. He gave a detailed statement of the valuable investigations undertaken in 1824, at the expense of the Duke of Bedford, and carried out by Mr. Sinclair, under suggestions by Sir H. Davy, for the purpose of ascertaining the composition and qualities of different Grasses, and the reason of their superior produce in particular cases. In these experiments the test of nutritive value was supposed to consist in the amount of soluble extractive matter obtained from equal weights of the several specimens of Grass. It was now, however, known that such extraction will give but a very imperfect indication of nutritive value, vegetable food being at the present day divided into the *nitrogenous* class, including albuminous and cheesy matter, the leguminous food of Peas, &c., and matter generally of an animal character; and the *non-nitrogenous* class, including starch, gum, sugar, and fatty matter. In the first class, the nutritive substance is partly soluble and partly insoluble, the cheesy and leguminous matter being only soluble under certain circumstances; in the second class, the nutritive substances are generally soluble. It was under these great and contradistinguished divisions that the investigation he had undertaken under the direction of the chemical committee of the Society had been pursued. He offered the results obtained simply as data on which inquiry might proceed, not as exponents of any assumed theory on the important question of the conversion of vegetable food into animal substance, on which so many distinguished physiologists and chemists held different opinions, and which, he thought, would receive its best solution by cautious induction from incontrovertible facts. He referred to the siliceous nature of the stems of natural Grasses, and to the opposite character of those of the artificial ones. He also cautioned the members against too hasty a conclusion of the value of produce from weight or bulk, which in many cases resulted from the large proportion of water the plant contained: he advised rather a consideration to be made of the per-centage of dry solid matter obtained, as a surer guide to such relative value. He cited and illustrated cases of the deception that might arise from such estimation of the value of a crop; and entered into a de-

tailed statement of the mode in which the Grasses had been collected by Mr. Bravender, and sent to him daily in closed tin cases: leaving the full elucidation of these details and his views generally on the subject to be given in a paper he was preparing for the Journal of the Society, to be published next month.—Col. Challoner referred to the probable advantage of Professor Way's double silicates for Grass-lands, deficient in the siliceous matter required for the natural Grasses.—Mr. Lawes favoured the members with a statement of those deductions, connected with the feeding of animals on nitrogenous and non-nitrogenous food, which he had drawn, not from theoretical assumptions, but from actual experiments on animals themselves. He pointed out the discrepancies arising in the present state of our knowledge, from the application of any assumed general rule on this subject, to cases of feeding. This result did not justify him in regarding nitrogen as an indispensable agent in these cases; if he made any assumption it would be in favour of the non-nitrogenous compounds constituting the food of animals, the nitrogenous being thrown away or wasted, while the non-nitrogenous were retained; but, without assuming the peculiar function of nitrogen in the animal economy, the truth in this, as in other cases, might lie midway between the extremes, and some relation hereafter be assigned between the two classes of nitrogenous and carbonaceous food best adapted for the purpose under each given circumstance. He entered into very interesting details connected with the striking results obtained by him in the course of his experiments on the feeding of animals. These will be given to the members in the pages of the new number of the Society's Journal, now in the press.—Dr. Daubeny remarked, that the results of Mr. Lawes's observations upon the superiority of non-nitrogenized over nitrogenized substances in feeding animals might be accounted for on this simple principle, namely, that the growth of an animal, beyond a certain point, depended rather upon the increase of fat than upon the increase of muscle. The production of the former would be favoured most by administering starch, sugar, and gum, and that of the latter by the albumen contained in the plant; consequently it must, he thought, be bad economy to supply any animal with a larger amount of nitrogenized matter than was necessary for making up the waste of muscle. He would also venture to make another remark, in order to supply what appeared to him an omission in Professor Way's very able and useful communication, namely, that, according to theory, the most profitable time for cutting the natural Grasses would be just when the largest accumulation of saccharine matter has already taken place. This would be just at the time when the flower begins to be developed, after which the secretions would undergo a continual diminution by being applied to the perfecting of the seed, for the use of which Nature had originally raised them up. He concluded by observing that these, like other theoretical suggestions, must of course be tested by practice; but he could not sit down

without expressing his opinion that the collection of such data as those which Prof. Way had brought together in the tables then hung up in the room would be of great service in suggesting experiments which might eventually lead to a more economical use of the Grasses employed in agriculture.—Mr. Slaney then favoured the Council with a very clear and striking statement of what he considered the points at issue in the controversies connected with the great question of feeding animals. In fact he considered it to be always highly advantageous to the practical farmer when "doctors disagreed;" for, in such cases, there ensued that discussion of real fact, and that gradual elimination of non-essential considerations, which eventually led to a sounder knowledge on the subject. He referred to the different characters of the artificial and natural Grasses, in respect to amount of nitrogen contained in each, and to the statements of Prof. Way and the experiments of Mr. Lawes, in reference to feeding-properties in each case. He could not, however, help drawing a marked distinction between the quality of bulk and fatness of an animal, and that nervous development of muscle which conferred strength; and for each of these opposite effects, the different classes of food he thought might be administered with great advantage. He understood from Prof. Way that the natural Grasses on which he experimented had not been grown separately in plots, but taken indiscriminately from the pastures on which they had grown; this, Mr. Slaney thought, did not give an equal area of natural Grass an equal chance of comparison with artificial Grass, to which, by the tables, it appeared so much inferior, because in the former case the natural pasture would furnish a considerable proportion of weeds.—Mr. Brandreth Gibbs pointed out, at the request of the members, the comparative permanence of the artificial Grasses on which Professor Way had made his analyses.—Mr. Rowlandson considered the annual value of pastures to preponderate over that of the other branches of husbandry. He complimented Professor Way on the sterling results he had obtained in this investigation of the Grasses: only those who knew the labour of arriving by experiment at such results could fully estimate it. He, however, perceived two omissions in the list, which it would be well, at some future time, to supply—namely that of Timothy Grass and the Yarow. The value of the former was well known; and although it was not desirable to introduce too much of the latter in light pastures, it was, generally speaking, a useful adjunct. He had for fourteen years made the cultivation of Grasses an object of his study. He referred to the selection animals made of particular Grasses. Cows, he remarked, would eat the soft meadow Grass; while horses would starve before they would touch it. It flowered, however, all the year round, and should enter in a small proportion into every pasture, yielding, as it did, as good a crop on poor land as any other Grass. Science and practice, he added, would eventually be found to meet; their occasional divergence arose from overlooking small but essential conditions. He fully

concurred with the observations of Dr. Daubeny and Mr. Slaney: he agreed, however, with Mr. Lawes, to a certain extent only, that the feeding or money-making power of vegetable food was to be attributed to the non-nitrogenous rather than to the nitrogenous compounds. When in North Wales, a few years ago, he was told that it was a well-known fact that, from cows fed in pastures of Clover and Tares the cheese was always indifferent; but that a dairywoman in one part of the district made the best cheese from cows fed on nothing but Tares and Clover, some secret management being alleged as the cause of her success. Mr. Rowlandson had afterwards an opportunity of meeting with this dairywoman; and he learned from her that the secret of her success consisted in housing the cows, and having the Tares and Clover cut and carried home to them. In this case, the cheese was always good; while it was always bad when the cows were fed in the field. This circumstance, he thought, partly explained the views both of Prof. Way and Mr. Lawes. The exercise of the cows fed on leguminous plants consumed the butter, and eliminated a larger amount of cheesy matter through the secretion of the milk, leaving the cheese poor in butter; while in the case of cows at rest in the house, the butter was not consumed, but eliminated with the milk, and passed into the cheese, which was accordingly of richer quality. In the feeding of pigs, too, Mr. Rowlandson did not consider either leguminous or starchy food alone so profitable as when both were mixed and given together. The quick-breathing power of young lambs also required nitrogenous matter to form part of their sustenance.

Mr. Ramsay, of Newcastle-on-Tyne, then moved the best thanks of the meeting to Prof. Way, for his valuable and interesting statement. He could fully perceive that the subject was one of the highest importance; but one also on the threshold of which we could only just be said to have fairly entered.—Mr. Fisher Hobbs seconded the resolution, remarking that there was no branch of farming so little understood as that of the management of natural and artificial grasses. He hoped these inquiries of Professor Way would direct attention to the subject, and lead to researches not only into the properties of the grasses themselves, but also into the adaptation of particular varieties for different soils, in order that hereafter the grasses may be cultivated by farmers to greater advantage than they have hitherto been done.—Colonel Challoner, in putting the question from the chair, alluded to the modest manner in which Professor Way, as a man of science, had submitted his investigations to the ordeal of practical corroboration; such a mode of procedure being as advantageous to the Society as it was honourable to himself. The Society ought not to be governed, in its endeavour to be useful, either by the *ipse dixit* of the propounder of abstract science, or by the statement of mere isolated facts by the practical man; but the two ought mutually to lend aid and light to each other in advancing the

cause of rational science, or that of sound economical practice. The members, he considered, were also much obliged to those gentlemen who had favoured the meeting with the results of their experience on the subject then brought forward. These weekly meetings of the Council, open to all members of the Society, were not intended to lead to the discussions of a debating society, but to enable members interested in particular branches of farming to compare their different opinions and practical results with each other, and with those scientific principles which were from time to time enunciated by the Professors of the Society.—The thanks of the meeting were then unanimously voted to Prof. Way, who acknowledged in suitable terms the compliment paid him.

The Council adjourned to their next weekly meeting, on the 18th of May.

A WEEKLY MEETING was held at the Society's House, in Hanover Square, on Wednesday, the 18th of May. Present: Mr. Raymond Barker, V.P., in the chair; Lord Bridport, Mr. H. Allen, Mr. Caldecott, Mr. Cavendish, Mr. Chadwick, C.B., Colonel Challoner, Mr. T. T. Clarke, Mr. Dyer, Mr. Gadesden, Mr. Glegg, Mr. Greenwood, Mr. Fisher Hobbs, Mr. W. Jones, Mr. A. Murray, Mr. Paine, Mr. Pocock, Mr. Serjeantson, Professor Simonds, Mr. Spencer Stanhope, Mr. C. Hampden Turner, Capt. H. Veyner, Professor Way, and Mr. Wrench.

PEAT-CHARCOAL FOR SANITARY PURPOSES.—Mr. Towers, of Croydon, communicated to the Society his details of a chemical examination he had made of the alleged powers of peat-charcoal as a deodoriser, and his conviction of its inefficacy to arrest the ammonia or ammoniacal salts existing in water passed through it. He was led to this examination by the "pestilence" with which Croydon had been visited, and which had been attributed to mismanagement in the accumulation and removal of the sewerage matter of that place under new regulations.

Mr. Chadwick said that happening to make a call at the Society's office, he had heard by chance of the paper to be read on the so-called "Croydon Pestilence;" without going into the merits of peat-charcoal, and its uses for deodorising town manures, he begged leave to correct the fallacious assumptions that Croydon had been a peculiarly healthy place, and that the epidemic referred to had been peculiar to Croydon, or that within the town it had been peculiar to the houses where new works had been carried on. The disease was as little peculiar to Croydon as the pleuro-pneumonia, which the Society was so well aware had ravaged their stock, was peculiar to any one farm-stead. The dysenteric-fever, or epidemic, had arisen soon after the unusually heavy falls of rain, and most severely in districts where the surrounding land-drainage as well as the house-drainage was bad. It had visited elevated positions which could not be protected from the influence of the bad land-drainage beneath them. The dysenteric and unusual choleraic types of fever had appeared after the unusual wet in different parts of the country; in several distant places nearly simultaneously. A more severe visitation of the like type of fever to that of Croydon, in the Malton Union, had been reported upon by Dr. Laycock, of York; particularly severe visitations of the same type had occurred in Leicestershire. In Surrey

attacks occurred nearly simultaneously in different parts of the county; in Croydon it occurred in places of widely different conditions—in houses occupied by persons of the best condition, even before those in the worst; in parts of the town which were unimpaired as well as in those where new works were going on. Instead of Croydon being peculiarly healthy, the fact was, it had been the least healthy in the county of Surrey, and whilst in the metropolis the deaths from zymotic or fermentative diseases were 23 per cent. of the total deaths, in Croydon they had, on an average of seven years, been more than 26 per cent.; and though a suburban town, its general average mortality had little advantage over the metropolis. Croydon had therefore been more highly predisposed—which state was well accounted for by its extra amount of pools and cesspool matter; but instead of suffering more than others, as alleged, it had suffered much less than other places. At Oxted, for example, which was a rural village nine miles distant, where there had been a much lower average proportion of zymotic diseases, and therefore a proportionately less predisposition, 16 per cent. of the population had been attacked, whilst at Croydon 10 per cent. of the population had been attacked. Had the attacks at Croydon been in proportion to the attacks in the more healthy villages, there would have been a thousand more persons attacked; had the attacks been in proportion to its predisposition, as shown by the test—the previous rate of epidemic disease—the numbers of persons attacked would probably have been double what they were. The local board had removed about 2,600 cesspools and a large extent of open ponds and ditches, which were no better than cesspools. Upwards of 18,600 superficial feet of evaporating cesspool matter had been removed from within the town, and beneath the houses, to a place of deposit containing 1,000 feet of surface, one-eighth of a mile from the town. That distant and reduced amount of evaporating surface had been charged as the cause of the epidemic, but it so happened that at its commencement the wind was blowing in another direction. Moreover, lime—not peat charcoal, he understood—was strewed upon the surface, and so little warning did it give by the smell that it was stated a medical gentleman, mistaking the surface, which was under a shed, for a whitened floor, had walked into the pool. When, then, the rate of attacks in other places was regarded, which had never been looked to, and the amount of predisposition was considered, it would be seen that the evident reduction of the amount of cesspool matter in the town lessened the previous predisposition, and had greatly reduced the attacks from the wide-spread epidemic causes. Had the works there been better done, and the removal of these predisposing causes been made in a more satisfactory and complete manner, the attacks would, in all probability, have been proportionately still less. When the main public works at Croydon were opened, the members of the general Board emphatically exhorted the local Board that that was only the first step, and the least important one; and that everything depended on the manner in which the house-drainage and private improvement works were performed. Unfortunately, the local Board had delegated this most important work to private bricklayers, and that, too, without the proper superintendence: the consequence of which had been, that there had been a larger proportion of inefficient and bad, as well as excessively expensive work, than there ought to have been, and that much of the proper benefit had been frustrated. On a close house-to-house examination of all the cases where death had occurred—100—it appeared that in only three were the works ascribed by the inquest as having influenced the disease; and there could be no doubt that they had done so, for, from the ignorant and clumsy manner in which they had been performed, the cesspool matter and evaporation, instead of being removed, had been increased. A consultation of the experience in other places would show that the complete removal of cesspool matter, by combined works and water-closets connected with tubular drains, had been attended with all the effects anticipated. But, to advert to an agricultural point, he might state, that although the refuse had been removed from near and beneath the habitations at Croydon, it had been spread out upon land, in some instances as a top-dressing, and in others by the method of the water meadows. The Council were aware of his objections on purely agricultural grounds to these methods of applying manures, as being less efficient and wasteful, as well as offensive. The general Board of Health found ague in men, as farmers found rot in sheep, attendant upon the common water meadow,

with only plain water. In several of the Italian States, the use of water meadows within six miles of cities was prohibited. But the general Board of Health had no power to extend similar protection. The works, when completed within Croydon itself, would nevertheless be found to be well worth the money they had cost, notwithstanding their defects; but however well the immediate site of the town might be drained, the susceptible, the very young, and the aged would be still affected by the ill-drained and ill-conditioned land surrounding the town and out of their jurisdiction. The general Board had shown that however well the site of London itself might be drained, the health of the population would still be affected by the condition of the Essex marshes and the Plumstead marshes contiguous to the N.E. and S.E. portion of the houses, and that after the prevalence of easterly winds, diseases, with the type of the marsh disease, cases of ague, were scattered amidst the population to the farthest portions of the inhabited site. Yet it had been proved that all those marshes might, by general measures, which had been prepared—but opposed and frustrated—have been drained—as the fen districts in Lincolnshire had been drained—by pumping, at an expense of from 3s. to 5s. only, per annum, as the Council were well aware, with great advantage to the land; but to obtain that benefit there was no power. It might be a topic to be submitted to the Society, the importance of extending the jurisdiction of local Boards, so as to bring as much of suburban lands as practicable within general arrangements, affecting land drainage, as by the substitution of tubular and covered road drains, for open and common ditch drains, which he had shown were dearer as well as less efficient.—A member of the Council asked Mr. Chadwick whether it had been found that the poor really used water-closets properly?—Mr. Chadwick was glad to have the opportunity of stating, that the experience of their use had been complete and satisfactory. There were many who at first would use them as small dust-bins, and occasion stoppages; but there were now whole towns and villages, as well as blocks of houses, where every cesspool had been removed, and where the water-closets substituted had been used as well as they were in the houses of the higher classes. In places where the water-closets had been constructed, as in some poorer districts in London, without water properly applied, the poor fetched water and kept them clean. He would take the opportunity of stating a fact, which the Society would be glad to hear, that in the model dwellings for the labouring classes, the main improvements of which consisted in the removal of the cesspools, the introduction of better water supplies, more ventilation, and less crowding, the health of the people had been strikingly improved. They had been freed from epidemics, and the deaths hitherto had been reduced to fourteen in a thousand—the general average being twenty-three in a thousand, which was a far greater improvement than under the most favourable circumstances they had any right to expect. If the general rate of the mortality in the metropolis were by the like works brought up to the present rate of mortality in all the model dwellings, there would be 25,000 deaths annually less than there now were; and if the general rate of mortality in England and Wales were brought to a level, with the rate which prevailed, amidst those improvements there would be 179,000 lives saved, to supply the emigration drain of population.

Prof. Way remarked that he had a good deal to say on this subject, which he would, however, reserve till next month, when he should have to bring the question generally of town sewerage, and its connection with agriculture, before the consideration of the members; he would only remark on the present occasion that he fully concurred with Mr. Towers' remarks on the inefficiency of charcoal to retain ammoniacal matter; he had in fact communicated to Mr. Towers this result of experiment, long previously obtained by him in his laboratory during his researches on the absorptive power of soils for manure: charcoal would act like any other filter in arresting solid matter; but a very slight amount of putrid organic matter tainted water, and this taint

might easily be removed, while the inodorous and colourless liquid might contain much manuring matter. He alluded to the periodical outbreaks of enormous torrents of water, and the emission of pent-up gas (probably carbonic acid gas), at different intervals of time, from cavities under the chalk hills.—Mr. Raymond Barker inquired the quality of this water, and explained the peculiarities of outbreaks down Henley Hill.—Prof. Way replied that the water contained much chalk held in solution by excess of carbonic acid.—Mr. Paine alluded to the "swallow-holes" under the chalk rocks in Surrey, which after thunder-storms gave vent to immense quantities of water eight or ten times during the year.—Mr. Gadesden referred to a similar occurrence at Mardon Park.

**COATING IRON PIPES.**—Dr. Angus Smith, of Cavendish Street, Manchester, favoured the Council with the following statement of his process for coating iron pipes intended to convey water, with a substance which protected them from rusting, and had been recommended by the Inspectors of the General Board of Health, and adopted by the Committee of the Manchester Corporation Water-works, the Directors of the Water-works at Stockport, Macclesfield, Rugby, Ormskirk, Penrith, and other towns:—

"As you ask me in what way I coat the iron pipes for water, I send a brief account of the process. There was and there is still a strong feeling of the value of soft water, and as such water cannot cover over the pipes with a coating of lime, which forms a protection from rust, a covering of some other kind for the iron was very much desired. I patented a plan which, if not perfect, has at least some advantages, and has been already used to a considerable extent. The plan consists simply in the use of certain products of the distillation of tar and pitch, of a certain tenacity. The materials must be chosen by experienced persons, or some time will be lost in finding the best. The pipes are cleaned, and are then heated in an oven to the heat of boiling pitch. They are then immersed in a vessel full of the melted pitch into which they are hoisted by a crane. They are put in perpendicularly so as to allow the pitch to run off smoothly, and are kept in about fifteen minutes. When they are taken out they have a very smooth surface, and may be severely hammered, so as to test their strength, without in the least altering the coating. We prefer before using this pitch to coat them over with some of the later products of the distillation of tar or to mix these products with the pitch, increasing thereby its tenacity. The pipes need not be first heated in the oven, but may be cleaned, and at once immersed in the heated mixture. This heat must be at least 300 deg. of Fahrenheit. I cannot well give my own opinion of this process, as it will be supposed that I am prejudiced in its favour; I will give therefore the opinion of those who have used it most, and refer to the engineer of the Manchester Waterworks, Mr. Bateman, and his assistants. Whenever I have asked the opinion of the engineers who have used it, I have received a favourable answer; and although constantly urging objections against it, I am answered with the assurance of success. Some which have been down for four years are now in excellent condition, I am told as good as at first. I believe this is all I can say on the subject. I am really unwilling to sound its praises, and the operation is too short to admit of many words."

Mr. Chadwick expressed a high opinion of Dr. Angus Smith's process, especially when applied to large pipes; for small pipes he was acquainted with another plan, that of Mr. Brocklesby, M.P., which had stood the test of twenty years' experience; the following account had been given of it:—

*Mode of preparing Cast-iron Pipes to resist the Action of Hard Water containing Mineral Acids of any Description.*—When the iron-founder knocks the case out, it should be done at the time the pipe has cooled down to what is a little below red heat—called black heat; then with a long staff, and mop of rags dipped in coal-tar, sponge the pipe through; or what is better, first pour some tar into the pipes, also first raking it round, and pass the sponge through, so as to ensure the whole interior being well smeared and coated with the tar. In the course of an hour or two, the tar will have become hard as japan on a tea-tray. If the pipes are cold before being so sponged, the founder may have a steam boiler, and he has only to turn a jet of steam through the pipe till heated up to 212 or 220 deg. Fahrenheit, and then proceed to sponge the inside as above proposed, as he would sponge out a cannon or a gun-barrel. When the inside is so done, sponge also the outside, as pipes laid down in some soils or clays perish as rapidly by outside corrosion as by the action of hard water inside. The writer of this did many pipes thirty years ago, which are still as black and smooth as the day they were laid down.

Mr. Goddard, of 8, Somerset House, London, communicated an account of improvements made in the reaping-machine by a Cornish millwright. Mr. Schottlander, of 3, St. George's-terrace, Dover-road, transmitted an account of M. Schott's boring apparatus. Mr. Reeve sent specimens of sugar from his White Silesian Beet-root.

The Council ordered their usual acknowledgments for the communications then made to them, and adjourned to their Weekly Meeting on the 25th of May.

The half-yearly General Meeting was held at the Society's House, in Hanover-square, on the 23rd May; Col. Challoner, Trustee, in the chair.

Before the proceedings commenced, the Secretary, Mr. HUDSON, read the bye-law relating to anniversary elections.

The CHAIRMAN said, the first business on the programme was the election of a President for the year following the Gloucester meeting.

Mr. RAYMOND BARKER said, he had had the honour, on several occasions, of proposing a President for the year; and, in entering upon the task that morning, he anticipated for his proposal a favourable reception by the meeting. The charter prescribed that no one should be re-elected to the office of President until there had been an interval of three years since his previous presidency. Moreover, they had, in by-gone years, more than once chosen a former President. Lord Spencer and the Duke of Richmond had both been elected twice; and there was one gentleman, who preceded half-a-dozen noblemen, by whom the office was held, in successive years, whom he thought it would be a slight to pass over then, especially as there could be no doubt that he would discharge the duties of the office in the most satisfactory manner. There was no one to whom the Society was more indebted than to Mr. Pusey (Hear, hear), not merely for his services in connexion with the *Journal*, but also for his advancement of everything scientific and practical in agriculture. He was convinced that Mr. Pusey would be highly gratified by this compliment being paid to him. Freed as he now

was from parliamentary engagements, he had full time to devote his mind to those pursuits in connexion with land, including drainage, and everything that had an important bearing on the prosperity of agriculture, in which he had hitherto been so distinguished; and it could not be doubted that, even for the public interest, it would be impossible to make a better selection. Next year, the Society was going to Lincolnshire; and he believed there was no member of the Society whom the agriculturists of that county would be more delighted to see presiding over its proceedings. Mr. Pusey had published an interesting exposition of the agricultural resources of that country, and had also taken a very active and important part in the fen drainage. In every point of view, he appeared peculiarly fitted for the office of President; and it was, therefore, with great pleasure that he proposed him.

Mr. W. FISHER HOBBS said he felt great pleasure in seconding the nomination. There was, he believed, no gentleman in the Society better qualified to fill the office of President than Mr. Pusey. The great services which he had rendered to the Society, both scientific and practical, would fully justify the meeting in electing him President for the ensuing year. Mr. Barker had alluded to Mr. Pusey's great labours in the cause of agriculture. He was sure they all valued those labours most highly; and he felt peculiar pleasure in the prospect of his presiding at the meeting in Lincolnshire. They all knew that, when he first took a brief survey of that county, he entered anxiously and ably into all the details of its husbandry; and he was quite satisfied that, now that he was likely to join the Society in its visit to Lincolnshire, it would be his endeavour more than ever to develop the superior farming of that great agricultural county.

No other name having been proposed, the motion was put from the chair, and carried unanimously.

The Earl of ROMNEY proposed the re-election of the trustees.

Mr. DYER seconded the motion, which was then put and carried.

Mr. MILWARD moved the re-election of the vice-presidents.

The motion was seconded by the Earl of ROMNEY, and agreed to.

The CHAIRMAN said the next business was the election of the general members of council. Papers had been distributed in the meeting, containing the requisite number of names; but it was open to any gentleman present to move a name instead of either of those in the list.

The Earl of Romney, Mr. Fisher Hobbs, and Mr. Dyer, were then appointed scrutineers, to take the votes; and after a short interval, they reported that the printed list had been adopted without any alteration.

The SECRETARY then read the following report:—

#### REPORT.

The Council have to report that, since the last General Meeting in December, 47 members have been lost to the

Society by death, and the names of 134 other members have been removed, on retirement or otherwise, from the list; while 170 new members have during the same period been elected into the Society, which now consists of

90 Life Governors,  
147 Annual Governors,  
739 Life Members,  
3928 Annual Members, and  
19 Honorary Members;  
making a total of 4923 members.

The current cash-balance in the hands of the bankers, at the commencement of the present month, was £3,300; of which sum the Council ordered £800, on account of life-compositions, to be invested in the public funds; the capital of the Society now being £10,764.

The Council have the satisfaction of reporting, that the great practical objects, for the development of which the Society was originally founded, continue to receive a powerful impulse through the communications in its Journal; the trial and exhibition of implements, show of live-stock, and assemblage of farmers, at its country meetings; the practical discussions at its weekly councils; and the personal co-operation of its members distributed throughout the kingdom. The two classes of direct investigations instituted by the Society: 1. for the purpose of discovering new modes and conditions of chemical action in reference to animal, vegetable, and mineral matter, and 2. for obtaining a more exact acquaintance with the origin, nature, and treatment of diseases prevalent from time to time among the live-stock of farmers; have been pursued with vigour by the professors of the Society, and have already led to important results in the one case, and to much valuable experience in the other. Progressive knowledge in agriculture is like that in every other art dependent on science for its advancement; as its sphere of operation becomes more extended, and its indications more accurately defined, it opens wider views of the application of those new principles, which are founded on incontrovertible facts, and have been deduced by the aid of science. As instances, however, are constantly occurring of hasty generalisations and illogical deductions, made in the application of science to agricultural data, and of the very different laws assigned, even by distinguished writers, to explain the production of the same phenomena, the Council recommend to the members of the Society a strict adherence to that inductive process attendant on the comparison and discussion of actual facts, which regards abstract science as only the referee to be consulted, or the prime-mover, whose subtle agency, like that of steam or electricity, is only available for practical objects, when its power is coerced, and its action restrained within required limits. The invaluable results which have already been obtained by such union of practice with science, lead the Council to the well-grounded expectation that still greater success will attend the future operation of that combined influence in promoting the cause of a sound and rational agricultural

economy. The ensuing number of the Society's Journal, now in the press, will contain the following, among other communications:—1. Prof. Way's Lectures before the Society, on his discovery of a natural source, in great abundance, of soluble silica, adapted for the preparation of the double silicates, on which he believes the absorptive power of certain soils for manure to depend; and on his analytical results of investigations into the comparative nutritive value of natural and artificial grasses and weeds. 2. Prof. Simonds's report of experiments made in this country, by direction of the Society, on animals affected with pleuropneumonia; and in which, by inoculation, according to foreign practice, with a morbid fluid taken from diseased lungs, the powerful counter-irritation of gangrenous inflammation to a certain extent in the system, rather than the production of pleuro-pneumonia itself, appears under certain conditions either to have subdued the ordinary symptoms of that fatal malady, or to have been in many cases the immediate cause of death. 3. Mr. Lawes's continuation of his valuable experiments on the of feeding animals. And, 4. Prof. Wilson's Lecture before the Society, on the agricultural and technical treatment of flax.

The Gloucester Meeting will be held in the middle of July next. The entries of Implements, as will be seen by the following tabular statement, are more numerous than in former years, the area engaged for their exhibition amounting to 105,000 square feet, and the shedding required being nearly a mile in length:—

YEAR OF MEETING	LOCALITY.	ENTRIES OF IMPLEMENTS.
1839	Oxford	23
1840	Cambridge	36
1841	Liverpool	312
1842	Bristol	455
1843	Derby	508
1844	Southampton	948
1845	Shrewsbury	942
1846	Newcastle	735
1847	Northampton	1321
1848	York	1508
1849	Norwich	1882
1850	Exeter	1223
1851	Windsor	No exhibition of Implements.
1852	Lewes	1897
1853	Gloucester	2032

The entries for live-stock will not close until the 1st of June, but those already made indicate the probability of a very large show in that department; including, from the peculiar situation of the place of meeting, an interesting exhibition in the classes of Hereford, Devon, and Welsh Cattle, Welsh Ponies, Sheep, Pigs, and farm-poultry. The termination of several lines of railway at the Gloucester station will prove highly favourable to the convenient transit of goods and passengers from every part of the country. The Council have made increased preparations for the due trial of the implements competing for the Prizes of the Society, and for the exhibition of Thrashing Machines to be kept in motion during the show, for the public display of their construction and powers.

The Council have decided that the City of Lincoln shall be the place for the Country Meeting of the Society next year; and that the district for the Country Meeting to be held four years in advance of the present year, namely, in 1857, shall comprise the counties of Dorset, Wilts, Somerset, and Haunts.

The Council have the pleasure of remarking, in conclusion, that there never was an epoch in the history of the Society, since the date of its formation, when its practical objects were more fully recognised, than they are at the present moment, by the spontaneous desire of so many promoters of agricultural improvement of every class in different parts of the kingdom to become enrolled as members on its list; the number of new members elected into the Society during the last five months being nearly equal to the total number of those elected during the whole of the previous year.

By order of the Council,

JAMES HUDSON, Secretary.

The Earl of ROMNEY moved the adoption of the report in the usual form.

The motion, having been seconded by Sir R. THROCKMORTON, Bart., was agreed to unanimously.

Mr. RAYMOND BARKER—in the room of Col. Austen, Chairman of the Finance Committee, who was prevented by indisposition from being present at the meeting—presented the following balance-sheet for the half year.

JULY 1ST to DECEMBER 31ST, 1852.

RECEIPTS.	
Balance at the Bankers', July 1, 1852	£2,822 19 6
Do. in the hands of the Secretary, July 1, 1852	14 16 8
Sale of Stock	1,248 0 0
Dividends	157 12 3
Life-Compositions of Members	158 0 0
Annual Subscriptions of Governors	155 0 0
Do. Members	1,761 8 8
Journal	153 17 0
Country Meetings	344 6 6
	£6,816 0 7
PAYMENTS.	
Permanent charges	178 12 6
Taxes and Rates	13 19 5
Establishment	437 15 7
Postage and Carriage	29 12 0
Advertisements	7 11 3
Journal	597 13 2
Chemical Grants	100 0 0
Do. Investigations	200 0 0
Prizes	1,543 7 6
Country Meetings	2,575 5 0
Transfer of Subscriptions	1 0 0
Sundry items of Petty Cash	5 11 1
Balance at the Bankers', Dec. 31, 1852	1,105 4 0
Do. in the hands of the Secretary, Dec. 31, 1852	20 9 1
	£6,816 0 7

(Signed) T. RAYMOND BARKER,  
C. B. CHALLONER,  
THOS. KNIGHT,  
GEORGE DYER,  
GEO. I. RAYMOND BARKER.

Mr. BARKER said it was further stated on the paper that the above balance-sheet was audited, examined, and found correct on the 20th of May. It was signed by the

auditors, and on the part of the Finance Committee by himself and his friend Colonel Challoner. He was happy also to be enabled to state that the society had in a certain degree recovered its loss at its country meeting last year—£800 having been set apart to make up the deficiency sustained at Lewes, where a meeting, commenced under the most hopeful circumstances, ended in complete failure as regarded the receipts.

Mr. DRUCE moved a vote of thanks to the auditors for their services.

Mr. HOBBS seconded the motion, and, in so doing, suggested that in future the meetings should be held at 12 o'clock, instead of 11, in order to ensure a fuller attendance. He was glad to have learnt that the auditors entirely approved of the mode in which the accounts were kept. The society was much indebted to the Secretary of the Society and to the Finance Committee for the clear arrangement of the accounts; and the statement of Mr. Barker was very satisfactory.

The motion was then agreed to.

The CHAIRMAN, in conveying the acknowledgments of the meeting to Mr. Dyer, the only auditor present, observed that, as an old member of the Finance Committee, he had often witnessed, not only the pains which the auditors took to see that the accounts were properly kept, but also their readiness to throw out hints to the Finance Committee with the view of securing, if possible, an improvement in the mode of keeping them. He felt that the society had reason to be proud of the manner in which its accounts were kept, and of the diligence of the auditors in examining them.

Mr. DYER begged to acknowledge the vote on behalf of himself and his colleagues, who, he was sure, would be equally gratified with himself to receive such an acknowledgment of their services.

The CHAIRMAN wished to observe, that he thought it desirable that Mr. Hobbs's suggestion, in reference to the hour for holding the meeting, should be followed in the case of the summer meeting. (Hear, hear.) The winter meeting should still be held at 11, as many agriculturists were under the necessity of leaving town early in the day.

Sir JOHN JOHNSTONE, Bart., M.P., moved a vote of thanks to Professors Way and Wilson, for their lectures during the past half year to the members of the society. He felt the greatest possible pleasure in proposing such a resolution. He had taken a very active, though humble part, in endeavouring to induce the society to spend a certain sum of money in seeking to improve by means of lectures the practice of agriculture; and it was a great satisfaction to him to find that the labours of these gentlemen had led to results which fully justified the outlay that had been made: and no one could doubt that the expenditure which had been incurred had not been made in vain. (Hear, hear.) That part of the report which related to the application of science to agriculture had been very skillfully drawn up, and presented the

matter in a very clear light. He regretted that during the past year he had not been able to attend the lectures so often as he could wish; but he knew sufficient about the matter to justify his proposing this acknowledgment of the services of the professors.

Sir CHARLES LEMON Bart., M.P., seconded the motion, which was immediately adopted.

The CHAIRMAN said the agenda having been disposed of, it now became his duty to ask whether any gentleman present had any suggestion to make. By the charter of the society the Council was the body charged with the management of the funds of the society, and with the general conduct of its affairs; but at the same time it was their duty to receive hints from members, and any which were given always received due attention. As an old member of the society, it had always afforded him great pleasure to receive any suggestion for its improvement.

No one having responded to this invitation,

The Earl of ROMNEY said he had now to propose what he was sure would meet with a cordial reception, namely, a vote of thanks to the Chairman. (Cheers.) They all knew with what interest Col. Challoner had always watched over the proceedings of the society, and how much they were indebted to him for the very important services which he had rendered. (Hear, hear.) In reading that very valuable publication, the Journal of the Society—a journal which no agriculturist could read without deriving benefit from the perusal—they must often have been struck with the many important hints and observations which emanated from that gentleman; and both for his general interest in the prosperity of agriculture, and for his conduct that day in the chair, he was entitled to their best acknowledgments.

The motion was seconded by Mr. Druce, and having been put by Mr. Raymond Barker, who temporarily occupied the chair for that purpose, was adopted by the meeting.

Col. CHALLONER said he was extremely gratified to find that the humble services which he had been enabled to perform while endeavouring to carry out the objects of the society were not unappreciated; and he was the more gratified at the expressions used by the noble Earl, because he had not the honour of his lordship's acquaintance. He really believed that the society had been of great use to agriculture (Hear, hear). Few societies in this country had had greater difficulties to contend with. The suggestions made to the Council on different subjects were so numerous, that they found difficulty in separating the chaff from the corn; and he was quite sure that day by day the society was gaining ground in the estimation of those who paid any attention to its proceedings. One of the best proofs that the state of public opinion was in its favour was the constant uniform flow of gentlemen who were desirous of becoming members. It was true, on the other hand, that many persons had retired from the society; but then they were not generally persons who were connected with agriculture, but persons who had joined it for the



sake of appearing, and perhaps of making a display, at the country meetings. Many names, too, had been retained of persons who had for a long period done nothing towards supporting the society. It was difficult to say when a gentleman's name should be erased; and there were persons, he was sorry to say, whose names were continued years after they had ceased to support the society either with their presence or their contribution. He was happy to say that the names of such persons were being almost daily replaced by those of gentlemen who manifested their interest in the society both by their attendance and by the regularity with which they paid their subscriptions. Such a fact, in the fifteenth year of the society's existence, was a strong proof of public approbation. He would only repeat, in conclusion, that he felt greatly indebted for the honour which had been done him.

The meeting then separated.

#### NEW MEMBERS.

The following new members were elected:—

Clay, Patrick, New Waterhangh, Berwick-on-Tweed  
 Cliffe, Henry, Gloucester  
 Craven, Thomas, Manningham, Bradford, Yorkshire

Franklyn, William Norris, Northlands, Horsham, Sussex  
 Goodyear, John, Watford, Hertfordshire  
 Griffiths, John, The Weir, Hereford  
 Gunter, Robert, Earl's Court, Old Brompton, Middlesex  
 Harkes, William, Lostock, Knutsford, Cheshire  
 Hayes, John Higson, Frodsham, Cheshire  
 Hitchman, John, M.D., Mickleover, Derby  
 Higgins, Thomas, The Barton, Cirencester, Gloucestershire  
 Ingram, Joseph, Wigan, Lancashire  
 Jervoise, F., Rotherfield Park, Alton, Hants  
 Mason, Captain George, Manor House, Yateley, Hants  
 Marriott, Thomas, Floor, Weedon, Northamptonshire  
 Matthews, James, Bouldon, Newent, Gloucestershire  
 McDermott, Edward, South Terrace, Camberwell  
 Melville, Alexander S. Leslie, Braunton Hall, Lincoln  
 Olliphant, Henry, Easton, Lincolnshire  
 Pearce, William, Kinver Hill Park, Stourbridge, Worcestershire  
 Redwood, Isaac, Cae-Wern, Neath, Glamorgan-shire  
 Roberts, Wightwick, Trethull, Sherlock, Cornwall  
 Robinson, John, Gloucester  
 Smith, Samuel, Upper Wells Farm, Brookthorpe, Gloucester  
 Sutton, Martin Hope, Reading, Berkshire  
 Telfer, John, Cuning Park Farm, Ayr, Scotland  
 Timmis, Richard, Wolverhampton, Staffordshire  
 Trimmer, Joshua, Wilmington, Dartford, Kent  
 White, Henry William, Monar, Ross-shire, Scotland  
 Wormald, John, Brunswick House, Charlton-Kings, Cheltenham  
 Wright, Robert, Moore Farm, Taunton, Somersetshire  
 Muspratt, Sheridan, M.D., Royal College of Chemistry, Liverpool.

#### THE TURNIP CROP OF 1853.

Without, perhaps, any very great weight of evidence, we have a foreboding sort of uneasy feeling about the turnip crop of 1853. It is not merely because the Spring has been cold and ungenial; not because we have snow at May-day, when swede-sowing ought to be going on, or frost as intense as February; nor is it indeed because the turnip fallows are only just stirred, and the cleaning operations delayed and retarded by the extreme pressure of Spring work; nor, lastly, is it that the manures have been washed out of the soils by the almost deluge of Autumn and Winter—none of these things, though in themselves unfavourable, are exactly what we mean; but the yearly visitation of the potato, the almost unmitigated severity with which disease has year after year attacked that plant, baffling the skill and research both of the practical and the scientific, make us fear that causes are in operation which may not probably be injurious to other plants.

The vine seems next to be the subject of attack, and the failing vintages are further evidence that some malign atmospheric influence is at work, which makes us dread that the turnip, from its artificial character, its great succulency, and its extended cultivation, may be the next object of attack.

We do not think that turnips in general were pre-

served with so much ease this Spring and last, as they have been on previous occasions. We stored away swedes in fine condition, laid them dry and sound in the Autumn of 1851, and expected as usual that they would come out sound in the Spring of 1852; but found vast numbers, not rotted in the sense of fermentation and decay, but preyed upon and destroyed by a fungoid and dry decomposition. We saw every single plant amongst our swedes of the growth of 1852, which appeared to turn brown and die, without any perceptible cause either in the land, the season, or the plant; and the white turnips were even in worse condition.

The first indication of the disease was a stoppage of the proper and vigorous growth of the tops. The leaves seemed to draw up together towards one focus, and to either stop growing altogether, or waste so as to be much smaller than the rest, and instead of lying gracefully around, to present a peculiar prick-eared appearance. The circles which unite the tops with the bulk then began to grow transparent, and showed from below a brownish black, not unlike the character of the colour in the potato disease, but of a blacker hue, and far less inclining to brown. Then the tops began to look a pale sickly green, and the rot apparently had set in. The turnips then resembled externally the following sketch (fig. 1):

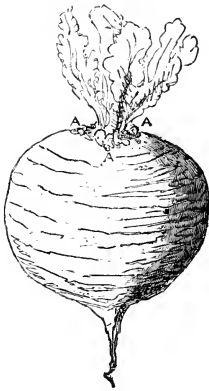


FIG. 1.

External appearance of a diseased turnip. A. A., decay shown by semi-transparent brown shining through the skin.

The root and lower part of the bulb appeared healthy, and the disease looked as if confined to the leaves and the neck. At this stage we were not able to discover any insects, nor any indications of their presence. We have seen something of the same kind of tops presented by the gnawing of a caterpillar in the interior of the top, and so into the bulb—the larvæ of the *Agrostis segetum*, and some allied species, but in this case the exterior seemed perfectly healthy, and the interior alone appeared to have originated the disease. We have attempted to give in fig 2 the state of the turnip internally at this stage. The tendency seemed to be to rot out the top and sever it from the bulb altogether. The bulb of the turnip was still sound, but the decay was rapidly spreading; the communication with the atmosphere seemed to be altogether arrested. The figure below is a section of a bulb in this stage.

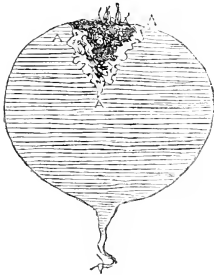


FIG. 2.

Section of a diseased turnip. A. A., progress of the decay.

The sounder parts adjoining the blackened decayed portions were becoming divided by a sort of semi diseased fissures, and thus spread rapidly over the rest of the bulb. The figure below will give an idea of the connexion between the sound and the diseased parts.



FIG. 3.

Decayed portion magnified. A. A., portions of the turnip represented in the foregoing figures.

The whole turnip was rotten before the external appearance denoted it beyond the line of semitransparent black round the stem. In the latter stage some insects were discernible, a variety of elongated maggot—feeding, doubtless, on the decomposing matter. What is very singular, the swede decayed in a manner somewhat analogous, but instead of the streak round the neck, the whole neck elongated, the bulb became stringy, and dry exfoliations seemed to take place inside the skin. We have attempted to give an idea of these in Fig. 4, which represents the interior structure of the swede quite dry and lying over each other in layers as thin as paper. Numerous centipedes and insects common to dry decay were found to be present; but the external appearance of the plant little denoted any such decay within, the leaves, though small and stunted, remaining on the top after the whole internal structure was gone.



FIG. 4.

Dry exfoliations inside the swede.

Now, when we remember that acres of turnips were totally lost by this disease, that in fields considered sound a large per-centage was found to be diseased in this manner on mature examination, and when we find that Mr. Ross inoculated four specimens of sound turnips in Aberdeenshire, with the matter taken from those already diseased, both at the sides and at the top, and the result of the four experiments was as follows,

Aberdeen Yellow.

Top inoculation.....6 tenths diseased

Side inoculation.....3 tenths diseased

White turnips.

Top inoculation.....7 tenths diseased

Side inoculation.....9 tenths diseased

—we think the tendency is to show that the complaint is a diseased tissue rather than any visitation of new insects, and the more uneasy do we feel lest it be but the forerunner of a wider-spread disease amongst our plants, arising, it may be, from an artificial atmosphere, but more likely from the efforts which cultivators are making in removing the plants from their normal condition.

We shall be glad to find that we are wrong; but we fear there may be more complaints of this disease

in the ensuing season, judging from previous visitations of similar diseases.

In Scotland the tops of the turnip seem to be affected with brownish spots. This we have not seen in England, nor would it perhaps attract any great amount of attention; but we shall feel it our duty to watch any similar indication nevertheless.

We have heard complaints that the turnip sown with guano had much more tendency to the disease than others, and this we can readily understand—the more you stimulate the plant, the more liable to disease it will be.

We shall wait with considerable interest to see whether the disease is one of the last peculiar season, and so isolated and calculated to be lost; or whether it is one likely to attach to the organisation of the plant, and be another difficulty in the way of the cultivator.

## TRANSFER OF LANDED PROPERTY.

It appears much easier to improve upon, than utterly upset, a system to which habit has long accustomed us. The one remedy would seem to be attended with as much promise as the other with danger. These dangers, too, of course increase in direct proportion to the magnitude of the measure we are dealing with. In, then, approaching a subject that the experience of centuries has taught us more or less to uphold, it becomes us to touch on it with the most careful consideration and forethought. A temporary abuse springing up out of the hour, may be met and stopped with scarcely ever too much promptitude and despatch. There are other evils, however, that have so gradually grown with, and clung to principles we have been taught to respect, that it is difficult to destroy the bad without at the same time injuring the good.

The land of this kingdom is proverbially beset with difficulties of the character we allude to. The law of primogeniture, upon which the Government of the country is based, may to some extent have to answer for them. It is, or has been, the good and the evil growing up together. Necessarily, part of our policy is to ensure a becoming position to those to whom we entrust the direction of our affairs. There is no disguising the fact that, so long as we live under the present form of Government, so long must the settlement of estates be a necessity. This, of itself, will always stay land from becoming that generally marketable commodity some of us are inclined to make it. We may improve—may weed out many an evil that has been suffered to grow on too long—but it is simply Utopian to suppose that the

land *generally*, of a monarchical kingdom like Great Britain, can ever be bought and sold like stock in the funds, or goods in the street.

There is no mistake greater than asking too much, notwithstanding what some of our authorities may say to the contrary. A man that confines his claims within the bounds of reason and possibility has a right to expect attention and redress. Let him, however, exceed these limits, and his demand will commonly furnish of itself the answer to it. In any movement, then, for facilitating the transfer of Landed Property, let the extent of the alteration we ask be grounded and tested by the possibility of obtaining it. Let temper and discretion be our chief guides, and let us be as careful of assailing the landowners with what a correspondent of this day aptly terms “argumentative abuse,” as of importuning the Government for impracticable reform.

We consider what we have written, nothing short of a compliment to those members of the agricultural world who have so lately turned their attention to this important subject. By them it has, so far, been considered with that spirit of moderation which prompted nothing beyond a practicable remedy. As we expected, too, the question has been taken up in other quarters, though not always with the same judicious moderation, but rather, it would seem, chiefly as a means for “argumentative abuse.” We regret this; while, at the same time, we trust it may in no way turn our friends from the *via media* they have adopted. The results, hitherto, of their deliberations have struck right at the root of the evils so long suffered to increase; and the remedies they

ask are as much in unison with the spirit of the age as they promise to be effective in their operation.

And what are these remedies? or what does the spirit of the times point to? Is it not to common sense ordeals, and simplicity of action, with the least expense and at the least trouble? Let us but enter our courts of law—where we shall have to go on this very point—and mark there how useless verbosity and needless charges are being successively abolished. Chancery is even to be stripped of its terrors—its years of suspense and multitudes of queries. And yet, strange to say, the very matters out of which so many of these queries arise are to go on just as they have gone. Grave lawyers assure us that the deeds which convey property from one to another can scarcely be shortened a line; and that the long complicated titles on which estates are held will still have to be looked into with the same curious appetite for a flaw or an omission (!) Here still rests beyond a doubt the perpetuation of that costly proceeding which regulates the sale of transferable property—which so cramps the efforts of both owners and occupiers, and so generally deteriorates the value of the commodity. We had hoped, from the progress of recent reforms, that our lawyers were freeing themselves from the charge of selfishness which the world has long been ready to make against them. It would seem, alas! that the character our poets and dramatists have so conventionally portrayed them in, is yet, more or less, applicable; in no case, perhaps, more so than in that we now treat on. See how a writer, long since passed away (Mandeville), sung on the abuses even then in observance, as well as on the remedy the Farmers' Club again advises:—

"The lawyers, of whose art the basis  
Was raising feuds and splitting cases,  
Opposed all Registers, that cheats  
Might make more work with clipt estates;

As 'twere unlawful that one's own  
Without a lawsuit should be known!  
They put off hearings wilfully  
To finger the refreshing fee;  
And to defend a wicked cause  
Examined and surveyed the laws,  
As burglars shops and houses do,  
To see where best they may break through."

When we come to note how much "the lawyers" have favoured other improvements, and how much and how lately they have opposed this, we think we have every reason for assuming that if there is any blame it must be with them. The simplification of titles and general registration of deeds are both practicable measures. We have ample proof already that they may be made to work well. These are the first means the tenant farmers ask; not for themselves exactly, but rather for those with whom they are so closely associated. Under any circumstances, we believe it would hardly be desirable that the occupier or cultivator should at the same time be the owner of the soil. The farmer has always quite sufficient employment for his capital, without attempting to encroach on the position of the landlord. We are confident, indeed, that the farmers themselves do not for a moment aspire to anything of the kind. We have, in fact, already ample evidence to show how much improvement has been impeded by the just "holding on" of small proprietors; men whose whole capital was absorbed in possession, and the claims arising out of it. The farmers of this age show no poor ambition of the kind. They have made no attack on the precedence allowed to the landowners. All they ask is simply to start fair; with full security for what they may accomplish, and due encouragement for that they may attempt. In a word, to repeat what we have already quoted, their endeavour is a laudable one—and may the lawyers, with whom after all the redress chiefly rests, follow their example, and—

"Make less work with clipt estates."

## PERUVIAN OR SKINLESS BERE.

The following letter from Read and Co., of Aberdeen, which we extract from the *Aberdeen Journal* of the 16th inst., will be interesting to our readers:—

Sir,—In attempting to improve the cereal products of any district of country by the introduction of hitherto unknown or uncultivated varieties of grain, it will be found that numerous obstacles lie in the way. And unless it can be satisfactorily shown by a collection of facts illustrative of the greater productiveness of these species, and the uses to which they can be applied, the difficulty is increased still more. A few years ago we had our attention re-directed to what is now known as "Peruvian or Skinless Bere;" and from observations and experiments since made, we are so convinced of its productiveness and adaptability to our northern soil and climate, and of its superiority to the usual kind cultivated for either milling or

malting purposes, that, with your kindness, we shall lay before your readers the facts we have ascertained regarding it. With the view of rendering this necessarily short sketch as complete as possible, it may be proper, first, to describe its

*Specific Character and History.*—Ear two and a-half to three inches long, six-rowed, regular; number of grains in each ear varying from sixty to seventy-two; grains, pointed or angular, and naked; awns upright, about three and a-half inches long, adhering to the under paleæ or husk.

Introduced by the Earl of Lonsdale, in 1849; a friend of his lordship's who had gone out and settled in Peru having sent him over a quantity of it. In 1850, Messrs. Lee, of Hammer-smith, obtained the produce, and distributed it over the country in small quantities. In its botanical characters we find it precisely identical with the *Hordeum graminæ-hesasticum* of Pro-

fessor Low, as described in his "Elements of Practical Agriculture," 4th ed., p. 347. It is also exactly similar to a kind of bere obtained from the Cape of Good Hope, about thirty-five years ago, and cultivated in this country for several seasons, which, curiously enough, during the first year of its cultivation, when the grain was ripe, dropped the awn; but in the second year it became quite persistent on the palea or husk, and that character it afterwards retained permanently. It corresponds also to the Siberian barley, described in "Miller's Gardeners' Dictionary," introduced in 1763, but neglected from some unaccountable cause. It must be distinguished, however, from a four-rowed naked bere or barley, which is inferior in several essential points.

*Productiveness.*—The produce on the Earl of Lonsdale's farm was enormous, being at the rate of ten quarters to the acre, and the weight of the grain 63 lbs. per bushel. It was grown on very light land, of a black nature, and highly farmed. Several agriculturists in this neighbourhood have also given us satisfactory evidence on this point. Arthur Harvey, Esq., of Tillygreig, writes us, that, "on 17th March, 1851, he had an imperial acre sown down, broad cast, with 1½ bushels; but a severe snow storm falling during night, previous to its being properly harrowed in, it remained comparatively unprotected for nearly three weeks, and he believes little more than the half of the seed sown grew. Notwithstanding this, however, the produce turned out to be three-and-a-half quarters of marketable grain, weighing 58 lbs. per bushel." The date of reaping was 10th September. In reference to this case, Mr. Harvey farther writes, that "the bere tillered beautifully, with fine strong straw standing nearly as high as Hopetoun oats, which grew beside it, not a stalk falling. Many plants I counted with 14 full heads, of 72 pickles each, on a single stool." On a farm in the Buchan district, three imperial acres were sown down last season, with eight bushels, which produced a total return of seventeen-and-a-half quarters, weighing 60 lbs. per bushel. Mr. Black, factor at Ellon Castle, also tested its superior productiveness, by having it grown in 1850, on different farms on the Ellon estates; and last season laid down a Scotch acre, with 4 bushels, which realized a produce of ten quarters, weighing fully 59 lbs. per bushel.

*Use in Malting.*—Before making any experiment with it as a malting grain, we considered it advisable to obtain from the Commissioners of Inland Revenue a declaration respecting the duty leviable, in order that maltsters might be relieved of individual responsibility or risk. Our communication was at once attended to, and produced the following satisfactory document:—

"Inland Revenue, Somerset House, London,  
December 18, 1852.

"GENTLEMEN,—I am directed to acquaint you that the Board have very fully considered the question which you have brought under their notice, as to the rate of duty at which malt made from the Peruvian grain—samples of which you forwarded for their inspection—should be charged; and that they are of opinion, founded on the reports of competent persons, that the grain in question is a species of bere or bigg, and that malt made from it in Scotland and Ireland will be chargeable only with the lower rate of duty.

"I am, Gentlemen, your obedient servant,

"(Signed) J. CLAYTON FREELING.

"Messrs. Benjamin Reid and Co., Aberdeen."

Since receiving this communication, we have had the malting properties of the bere very satisfactorily tested through the assistance of Mr. Eddie, brewer, Virginia-street. In conducting this experiment, Mr. Eddie was anxious to prove, more immediately for his own satisfaction, whether, in the use of Peruvian

bere for malting purposes, there would follow any advantage over the common kind. Accordingly, he employed four bushels of malt of fair average quality, weighing 40 lbs. per bushel, made from common bere. The extract obtained, when examined at a temperature of 60 deg., was 184 gallons of 21 lbs. density, according to Allen's saccharometer. Mr. Eddie then employed, with similar accuracy of manipulation, an equal bulk of malt made from Peruvian bere. This malt weighed, however, 41 lbs. per bushel, and the extract obtained, when examined at a temperature of 60 deg., was precisely 184 gallons of 26 lbs. density. The relative value, therefore, of the Peruvian bere, over the common for brewing purposes, as calculated from the difference arising out of each extract, is as 21 to 26, or fully 16 per cent. But, supposing weight for weight in place of bulk for bulk of each kind of malt had been employed, a difference of fully 6 per cent. would have still resulted in favour of the Peruvian bere. Again, if the Peruvian malt had been used in distillation, its superiority would have been still more apparent. As every 100 gallons of worts of 5 lbs. density gives one gallon of proof spirits, the extract obtained from the Peruvian malt, being 184 gallons of 26 lbs. density, would give 9 17-32nds gallons, or at the rate of fully 2½ gallons proof-spirits for every bushel of malt. As a distiller has a short process of malting, and would employ a large quantity at a time, he would no doubt increase materially the amount of extract; and hence we understate the value of Peruvian bere for distilling purposes, rather than overstate it. Mr. Eddie assures us that the malt is excellent; and his affirmation is attested by other practical judges who have expressed to us their willingness to purchase this bere from the farmer, when it is offered in sufficient quantity, and at a marketable price. We bring forward one other additional proof out of many. The original exporter of the grain, having established a brewery in Peru, tried its malting properties there, and, finding it good for the purpose, is now no longer under the necessity of importing from England as he had hitherto done.

*Use in Milling.*—Several instances are known to us of its having produced a superior quality of meal, with a more profitable return in quantity than the common kind. In 1851, Mr. Harvey of Tillygreig, milled half a quarter against half a quarter of other barley, and found the Peruvian to turn out weight for weight more meal. At Ferryhill Mills, a quantity was also recently milled. In this case, it yielded of excellent meal 92.55 per cent.; waste 7.45 per cent. Of pot-barley 64 per cent.; dust 36 per cent. In "Miller's Gardener's Dictionary," it is described as yielding 60.6 per cent. of flour equal to London seconds; 30.3 of a coarser sort; and 9.1 per cent. of bran superior to wheat. The flour made excellent bread, both by itself and when mixed with wheaten flour, and was more retentive of moisture than wheaten bread.

*General Remarks.*—It will be gathered from some of the preceding statements that about three bushels of seed are amply sufficient to sow an imperial acre. We may state, as the result of experience, that, if sown too thickly, not merely will the straw be diminished in bulk, but the grain produce will also suffer proportionately in weight and quantity. In regard to the mode and time of sowing, the usual methods adopted in sowing common bere or barley may be followed with every confidence. It has been found in most cases to ripen rather earlier than either of the latter. In harvest time it should be well looked to, and not allowed to get too ripe before being cut down, as the straw, otherwise abundant and good, might become slightly brittle, and therefore of less value.

In directing public attention to this grain, we have only further to remark that, from the uniformly consistent reports we have had of its superior productiveness, from the little trouble

it gives in thrashing and dressing, from its value if used for feeding, and from its having been proved by actual experiment to be well adapted for all purposes to which here or barley are usually applied, we have no doubt, if accepted by the agriculturists of this quarter, it will prove itself a valuable cereal auxiliary. Mr. Harvey of Tillygreig, whose agricultural experience is extensive, and whose opinion is therefore valuable, writes to us the other day thus favourably of it—"In respect of produce of this, as tried against other barley, I have, both in

1851 and 1852, a larger proportion to the acre of Peruvian than of other barley, in quarters; I have a weight per bushel extra; I have equal bulk of straw; my grass offers better where it grew; it has been earlier; it does not shake more readily, though the awns being very brittle it is easily divested of them when fully ripe, and which may cause the careless observer to think it is apt to shed its seeds; it is not apt to lodge, and it is less trouble in dressing when brought into the mill, requiring no hummelling."

STATISTICS.

SIR,—I beg your insertion of my estimated production and consumption of wheat and breadstuffs of the United Kingdom, in the total absence of any measures adopted by the present or any previous Government, or other ways, compiled from the authority of eminent statisticians and other valid sources.

I remain, sir, your most obedient servant,  
 JAMES SHEPPARD, Corn Merchant.  
*Pelham-street, Newark-on-Trent, Notts, May 20, 1853.*

PRODUCE OF WHEAT.

Extent of land cultivated with wheat in the United Kingdom, twenty million statute acres; and production of the same, taken at a full average crop, equal to four imperial quarters per acre; and the population at the close of December 1852 (emigration deducted) to the same period, 27,500,000\*, and the annual consumption of the same for 1853 is 23,750,000 qrs. of wheat and breadstuffs.

	Qra.	Qrs.	Deficiency of the consumption. Qrs.
Estimated consumption of the population for 1853, of wheat.....	23,750,000		
Estimated produce of wheat crop for 1852.....	18,709,678	5,040,322	
Estimated average importations of wheat and breadstuffs of the last six years, required for 1852.....			8,177,757
Total deficiency to be provided for from the harvest of 1852 to 1853.....		13,218,079	

	Qrs.	Qrs.	Qrs.	Deficiency of consumption yearly. Qrs.
Estimated consumption of the population for 1854, of wheat.....		24,000,000		
Estimated produce of wheat, owing to the deficiency in the planting one-fourth seed in the autumn and spring, equal only to.....	15,000,000			
One-fourth of seed not planted.....	312,500	15,312,500	8,687,500	
Estimated average importations of wheat and breadstuffs of the last six years, required for 1853.....				8,177,757
Total deficiency to be provided for from the harvest of 1853 to 1854.....			16,865,257	

If there is a full average crop of potatoes, however, in the present year, two and a half million quarters of wheat must be deducted from the deficiency above given for 1853, as the produce of last season is estimated at only half an average yield, a full average produce of sound and good potatoes, and equal to five million quarters of wheat, in England, Wales, and Scotland; but it must be fully understood, in the event of unpropitious weather from hence to the securing of harvest, that the estimated deficiency in wheat of 16,865,257 qrs. in 1853 will be increased proportionately.

The agricultural reports up to the present time of the wheat crops, closing with April, state that the south of England admits only three-fourths of an average breadth of land to be planted in the autumn and this spring; east, one fourth; west, one-third; and north about one-fourth less than in average seasons. The month closing with cold and ungenial weather, it may also be added that one-fourth of the present growing crop of wheat has been planted to great disadvantage during this spring, the land being in such a saturated state that the drill would not work, and the wheat sown broadcast, which results in the crop at present being in an unclean state, and cannot be properly cleaned, in which case the crops are expected only to yield at most two-thirds of an average crop, inferior in quality, and greatly liable to mildew; deficient in weight, and inferior to autumn-planted.

It is stated, almost without exception, by practical tillers of the soil, that unfavourable periods for the sowing or drilling of wheats are invariably attended with heavy future losses, and the results of spring-sown wheat are always very uncertain, and a deficiency in produce and quality is to be apprehended; and, although it is yet quite premature to hazard an opinion as to crops generally, yet a report is strongly gaining ground by experienced and practical farmers, that the deficiency in the breadth of land planted in wheat this year is far short of what they at one time expected, and the wealthiest are holding back their supplies, being well assured wheat must ultimately go dearer; and particularly as the periods for hastening their supplies of wheat to market is past, being at the present time fully prepared to meet *May-day wages*; and they think that wheat has seen the lowest point for the *finest qualities*, and they also regard the present liberal supplies of foreign wheat, flour, and breadstuffs as scarcely the average proportionate part of the 8,177,757 qrs., and average of the last six years' imports, and which is considered as absolutely requisite to see into the new crop.

It is also to be noticed particularly, that, in consequence of a *free-trade* in corn, and the immense imports of precious metals, the great abundance of money, the unusual activity in the manufacturing districts, the rapid increase in the exports, the advance of wages to artisans and labourers of all descriptions in every department of trade, the high price of meat, scarcity and high price of potatoes and other vegetables, and

\* In the estimated consumption of 23,750,000 qrs. required for the annual consumption, the population of the islands in the British seas, army, and navy, of 481,653 qrs.; also the wheat used in starch and sizing in the manufacture of linen, cotton, sacking, roperies, distilleries, &c., are not taken in the former deficiency, which may amount collectively to one million more.

the backward state of vegetation generally, that an increased demand for wheat and breadstuffs is by no means improbable, until we are fully supplied with the new crop of potatoes, peas, &c., &c., and particularly if we are not well supplied with foreign wheat, flour, and all breadstuffs, upon the extent of which, and a favourable change in the crops of wheat generally, depend the prices of the future; that an average yield of wheat cannot now be quite certain, and at least three weeks more backward than average seasons; but it must be admitted, if a fine harvest and a genial one, it will have its full influence to depress our prospects in the upward movements of wheat. Since the above was written, I have received the amount of importations from the 1st of January to the 9th of

May, the present year, inclusive; and, without going into detail, it amounts for wheat and breadstuffs only to 1,601,106 qrs., and grain 265,508 qrs., collectively 1,866,614 qrs. I also received, by this day's post, from the continent, a statement of the stock of grain in warehouse, and the probable arrivals as soon as the rivers are cleared of ice in the interior rivers of Russia, &c.; but, being given in foreign measures, I shall defer forwarding the statement until reduced to the standard of Great Britain, and which will accompany other important information as to the foreign corn trade. In conclusion, I beg to remark that neither the stocks on hand of grain, or to come forward during this summer, are so large as is generally reported.

## LAND: ITS POLITICAL ECONOMY.

The tide of politics is evidently setting in stronger and stronger against the feudal notions of our forefathers, relative to Land and its Political Economy. Prior to the free trade measures of 1846, and the blue-book information of that period as to the burdens upon land, agricultural customs, &c., it was flowing, making slow but certain progress. But since that period the landmarks of the farmer have entirely disappeared, leaving him to navigate the ocean on which he had launched his barque, subject to a thousand trade winds, monsoons, &c., &c., of which he has no experience. The change is doubtless great, but not greater than what our forefathers experienced when they first trusted to the compass, bidding farewell to the high hills and promontories which had so long guided them successfully in their journeyings across the deep; while the issue is no less promising in the one case than it has been realized as profitable in the other.

There cannot be a doubt but farmers will ultimately triumph in that enquiry about land and its political economy now agitated from one end of the kingdom to the other, carrying everything before them; for it is the triumph of science over the dogmas of a barbarous and illiterate age. It is just as possible to return to the practice of the fourteenth century, as it is to stand still in "*Farmers' Politics*" at present. Hence the impropriety of their landlords standing so far aloof from them as they are now doing; and not only standing aloof, but even throwing their own mortgages and incumbrances upon their properties in the way of progress! And what renders this the more reprehensible is the fact that the interests of the landlord and tenant are inseparably connected; indeed, the two parties are political members of one body—the *landlord and tenant system*; so that there is no one who ought and will commiserate more sincerely with the malady of the former, so long as it wears a chronic character, than the latter; but the moment it assumes an acute type, commiseration is then not enough—amputation must be promptly submitted to, in order to save the life of the patient. To sit still, on the part of the farmer, in an emergency of this kind, would be suicidal. After things get to this state, tears must give way to the instrument of the surgeon. Duty and interest both demand it alike of the landlord as the tenant, and

the latter is not the party to make the sacrifice here involved.

The old saying, however, that "every one feels best where his own shoe pinches him," is a true one; and we do not at all wonder at landlords being unwilling to sell their encumbered estates, for they best feel their own embarrassments, and cannot but perceive that much of that argumentative abuse, so to speak, now being levelled against them, is perfectly groundless, being without a foundation. For example, they cannot but perceive that the mere transfer of land is no guarantee to its improvement; while they themselves are equally good landlords with many of their neighbours, who have their thousands and tens of thousands in the public funds, and equally respected by their tenants.

The case of the late M.P. for Kent, noticed in the columns of this journal on the 9th, proves this latter conclusion relative to tenants, although we cannot speak practically as to the management of Hempsted Park itself and estate. We can, however, point out hundreds of encumbered estates better managed than as many not encumbered, and estates lately transferred as badly managed as they were previously. We also know properties sold which the sellers afterwards had good reason to regret having taken the advice of their agents as to doing so, because they could have redeemed them had they acted as they ought to have done, and might have done had they received timely advice; and we believe there is a very large area of the encumbered property in Britain in this very state, which could easily be redeemed if landlords would only take a proper view of domestic economy and their own professional duties—a line of policy which many are now manifesting a great anxiety to follow. It is certainly humiliating to think of the channel in which the rents of very many landed estates flow, contrary to the wishes of their owners, after they leave the pockets of the careworn tenants, whose industry gathers them from a neglected soil—a soil which would soon redeem all the debts upon it, were its rent spent as it ought to be, as we ourselves could prove; for, from our limited experience in the improvement and cultivation of land during the last 30 years, we could point out numerous estates in England, Ireland, and Scotland of this kind, where debts would soon disappear from estates

were their owners only free from the shackles of an antiquated and oppressive law, and where neither the interests of the country, much less the tenantry, demand a change of proprietors, but where both loudly call for a change of management.

On the other hand, it cannot be denied that very many landlords have gone so far beyond their depth as to leave no hopes whatever of redemption; while experience points to numerous examples, where transfers have been followed by improved management. Hence the obvious conclusion in favour of reformation of the law of transfer.

The sellers of encumbered estates are, however, not the only parties who require an alteration in the law of transfer of land, as Mr. Baker, at the London Farmers' Club, justly pointed out; for many crooked marches, detached fields, and the like, to be met with on all properties, demand legislation. In this respect the majority of English counties exhibit a very anomalous appearance, affording a fruitful source of animadversion to all travellers who have reverted to their subdivision into farms and fields.

In selling and purchasing land at present, three evils are experienced. *First*, there is the difficulty and expense of obtaining the titles; *second*, there is the difficulty of lending or borrowing money on land, from the antiquated and even absurd character of all deeds and forms connected with the same, and the manner such operates upon the titles and transfer; and *third*, there is an expensive system of transfer afterwards.

Now, these are three very comprehensive and important subjects, distinct the one from the other, requiring separate legislation for many reasons, and therefore ought not to be jumbled together, as they generally are when brought before parliament or the public for discussion. Each requires an act of parliament by itself, and to be publicly discussed by itself. If such were the case, we hardly think there could exist such a diversity of opinion on many points as there now does.

Again, the public has certainly a right to know who are the owners of the soil. The tenant, for instance, has a right to know who is his landlord, and therefore no doubt should exist at any time as to his titles; and besides, the right of the public, the letting of land to tenants, the payment of poor's rates and taxes, alike demand that landlords establish their titles; for if the landlords' titles are bad, their leases are equally so. We would therefore suggest that they be allowed to make good their titles according to statute, within a certain period.

The principle on which statute should enforce this national work is doubtless registration analogous to that of funded and other property. On this point we believe there are scarcely two opinions, so that argument is not required. The registration of the whole, at first, would be a work of some labour, but afterwards would be easily controlled, and might be so, in the provinces, by the sheriffs in many cases, so that a general registrar and staff would only be required for the metropolis and some of our other large towns, as the labour demanded. A peculiar kind of scrip might be manufactured, termed "land scrip," and given to landlords when they had registered. Along with the application for registration,

landlords would require to give in three plans of their estates—one for the general office, one for the county office, and the third to be returned along with the scrip. And besides these plans, government might have general county plans, on which the different landlords' estates might appear in different colours, so as to make them the more easily distinguished in matters of reference. But further into details of this kind it is unnecessary for us to enter at present.

2. In borrowing and lending money on land, the parties have respectively to consider what they give, what receive in security for the loan. The former generally says a good deal more than is necessary about its value over and above the loan he asks; the latter, more accustomed to business habits, confines himself to the rent, after deducting public burdens, and as to how it tallies with the interest he expects for his capital, leaving a sufficiently broad margin to cover the solvency of tenants, with the casualties to which rent is subject. The landlord may boast of the fertility of the soil, its produce and capabilities; but with him rent is the landlord's interest in it, and he invariably takes care to make sure of this, future as well as present, until his capital is repaid.

Rent, however, although it may represent the landlord's interest in the soil, does not represent that of the tenant, much less the public. The public interest is the whole produce, estimated at upwards of £200,000,000 for the United Kingdom annually, of which rent does not form one-fourth part. Hence the landlord's interest is about one-fourth part that of the public, while even this fractional part is subject to numerous burdens; consequently the public has a right to control the mortgaging of land, so as not to interfere with its interest in it, and this it can only do by statute.

The interest which the landlord has in the soil is not only of a very limited character in the sense above noticed, but also by its being subject to tear and wear, for which heritable bonds seldom or never make any provision. For example, the natural fertility of the soil is subject to be exhausted by cropping, and houses, fences, roads, drains, &c., to decay, requiring renewal at the expiry of certain periods—conditions for which heritable bonds make no provision directly, although a margin is generally left sufficiently broad to cover them, as has already been noticed; while, on the contrary, they seldom fail to include any increase of rent superadded to the rent-roll by an additional investment of capital, either by increasing the natural fertility of the soil, or by a more efficient system of houses, fences, roads, drains, &c., or both, excluding thus the new investment from the security of the increase of rent to which it is justly entitled, and hence excluding the improvement of the soil by borrowed capital, although that very improvement would be in favour of the first lender. Primarily the landlord may have invested £10 per acre in reclaiming the soil, building houses, erecting fences, and making roads, while its natural fertility may be estimated at £10 more—or indicated by its yielding 30 bushels of wheat or 20s. of rent—making his total investment of the value of £20 per acre, returning 20s., or five per cent. At the period of the second investment—between tear and



wear on houses, fences, and roads, and the exhaustion of the soil by cropping—the original investment and value may have fallen to £15, or even to £10, although 20s. of rent may still be annually obtained from the tenant; and even this does not represent the loss of the tenant and public, for the amount of produce may have now fallen from 30 bushels to 20. By the second investment of £7 10s. in draining, £2 10s. in houses, and £10 in lime and manure per acre, the produce may be doubled, or increased to 40 bushels and upwards per acre; but promising as may be the experiment—equally flattering to both landlord, tenant, and the public—yet the landlord, for the want of capital, is unable to extend the experiment to the whole of his estate, so long as the incumbrance remains upon it. Hence the position of parties, and the object which statute has to effect.

In this case it may be said that the landlord has himself to blame, as the heritable bond ought and might easily have made provision for the second investment. Objections of this kind, however, are easily refuted, for stipulation has no right to cover legal defects. The law should be right in the absence of stipulation, which it is very far from being in all cases between landlord or tenant-rights. Statute should make provision that the benefits arising from separate investments should respectively belong to each, and that they might be given in security accordingly, where the capitals had to be borrowed.

The legal machinery which the working of such a statute would require must be similar to the last, and therefore should be in the same office. Registration and plans, with a separate set of books, would be required to secure the lender's title and interest, as well as that of the borrower and the public.

3. Such being the nature of the two first measures, the sale and purchase of land would be of the simplest kind. The *land scrip* of freehold and unencumbered lands might be sold like the scrip of the public funds. Where land was encumbered, provision might be made that the purchaser, with consent of the landlord or seller, pay the price into the hands of the registrar, from whom he would receive his land scrip, with the number affixed to his entry. This would secure to the seller the entire control of his property prior to being sold, and at the same time protect the interests of the other two parties—the mortgagee and purchaser.

Such is a general outline of what would be required for the registration of landed titles, mortgages of land, and the sale and purchase of estates; and we aver that the more the subject is discussed the more will public opinion be inclined to favour our suggestion of settling the three propositions involved separately by separate acts of parliament. That objections may be brought against our theory is more than probable; but we do not anticipate any worthy of refutation. We have

not mentioned entailed estates, and others of a limited kind, under the first head; but we would register the whole under their respective designations. We have suggested that sheriffs, in some counties, might control the whole; but a revision might be made in the collection of poor-rates and all taxes connected with land, bringing the whole into one office in every province, along with the above duties of registration. The several duties are of a kindred character, and could be more efficiently and economically controlled in one office, or under one roof, than separately; while they would require that the principal in every office be possessed of a more extensive and practical knowledge of agriculture and its improvements than the majority of sheriffs have at present, because they are more of an agricultural than a legal character; and this demand such a combination would be the means of effecting.

But after the legal reforms in question have been obtained, and desired transfers of land made, the advocates of these measures, and benefits resulting from them, will, it is feared, be sadly disappointed; for the theory enunciated during the free-trade controversy of 1816 for the relief of British agriculture, and subsequently echoed by Mr. Caird and many other agriculturo-political writers, is very defective, and totally inadequate to meet the exigencies of the landlord, the tenant, and labourer; for no provision is made for their surplus population, amounting to about 200,000 annually. Hitherto we have succeeded in providing for our surplus in the manufacturing and commercial world; but this is no longer practicable. Attention must be turned to our boundless colonies. The labouring part of the population are beginning to feel the benefits of the theory we have for the last ten years been humbly advocating, and are at present contemplating. The total wages of the farm labourers of the United Kingdom have only hitherto amounted to about from £40,000,000 to £50,000,000; in our colonies they would amount to upwards of £100,000,000. Many have been the complaints about extra taxes in competing with the foreign farmer; but the United States, our greatest rival, pay more for labour—in addition to what we pay—than all our taxes put together. In point of fact, our labouring population have hitherto paid the bulk of our taxes in the shape of a reduction of wages—a fact which is now beginning to stare both landlords and tenants and manufacturers in the face; for the gold-diggings and Irish exodus have already reduced the supply in the labour market, the benefits of which the labouring classes are beginning to feel by an advance of wages. Hence the conclusion:—the labour markets are subject to the same laws of supply and demand; for *Science* has not one law for the rich and another for the poor, as both will eventually experience, for there is no partiality in her policy.

## NOTES ON BEES.

Having unfortunately just now a good deal of leisure, if you will allow me space in your Journal, I will endeavour to call to mind a few observations made last summer, and put them together for the amusement of your readers. I have on former occasions brought before them the labours of the honey bee, summing-up at the end of the year the success which attended such labours. This, however, I was prevented doing last year. As far as I can recollect, the spring of 1852 was the worst, and the swarms the latest, I ever knew. My first swarm did not come off till the 4th of July. About Easter the old stocks had collected a considerable quantity of honey, but afterwards it became very much reduced. In ordinary seasons I never expect the stock of honey to increase after July; but last year was an exception; and although up to about the middle of the month scarcely any had been collected since Easter, I think I had more on the whole, from the same quantity of bees, than I ever remember to have had before. It was remarkable that, while this accumulation was going on, there were but very few flowers in the neighbourhood; and frequently have I walked through the garden and pastures without seeing a single bee on the flowers. From repeated observations I found that nearly the whole of their store was collected from the leaves of the large trees, of which there is no lack in this neighbourhood. At this time there was an unusually large quantity of honeydew, produced, as I suppose, by the check which the trees had experienced from the unkindly weather at the time of their early growth. I have on a former occasion stated that bees will often hang out and refuse to work in the glasses, although there may be abundance of food near them; and will at once commence work if the glasses are removed and a hive placed in their stead. To test this again, I took part of the glasses off a hive, and covered the remainder with a box hive similar to the under one. The bees set to work, and so arranged their combs as to build the glasses in. I was aware that I should have some difficulty in taking them off, but having counted the cost I let them proceed. The time having arrived when I wished to see how matters stood, I proceeded to separate the two hives. True enough, it was a difficult operation; but I succeeded in doing it, and managed to get rid of all the bees except about as many as would fill a common hen's egg-shell. These clung together, and so determined were they not to quit, that I had to separate them by force, when I found a queen in the middle; and I have no doubt that they were separate colonies working through the same entrance, as the bottom stock never appeared to miss the queen, nor could I prevail on her majesty to enter it. On the 8th of July I was informed that some stray bees had just then taken possession of a hollow tree: the hole where they entered was about 30 feet from the

ground. This agrees with what I stated on the altitude at which bees are usually found when they choose their own habitation. I was anxious to possess them, and having a glass hive which I use for amusement, I determined to dislodge them. This was a difficult task, and took me the whole of the day till nearly dark, and then it was quite uncertain if I possessed the queen, for I did not see her during the whole of the time I was employed. Having so far succeeded, when they had become reconciled I took them home, and placed them in the window of an upstairs room, where I could easily observe their movements. In a few days I had the satisfaction to see her majesty there, surveying the works and laying eggs for the production of a young family. I will just observe here that the progress of the inmates of this hive are usually noted down one or more times daily, for future reference; but unfortunately I cannot now tell where to lay my hand on the book—a circumstance I much regret, as what I am about to state will lose much of its interest for want of the dates. Breeding and storing went on well for a considerable time, but, for some now forgotten reason, I omitted to visit them for two or three days; when, a friend wishing to see her majesty, I opened the door of the room to gratify his curiosity, and was much surprised at the discordant sounds which proceeded from the hive, instead of that delightful harmony always observable in a thriving stock of bees. In vain did we look for her majesty—all was confusion and uproar—she had either abdicated her throne, or death had made her his prey. The once loyal subjects, formerly acting in concert with each other, and regular in all their movements, now gave way to despair, and seemed to vie with each other in the destruction of that work which they had so cordially united to construct. Devastation seemed now to be the order of the day. Without a ruler or a guide—no one “greater than the rest”—all appeared to go the wrong way, nothing but want and ruin staring them in the face; for they had commenced unsealing their stores, as if resolved to live well and easy while it lasted—none thinking it worth his while to add to the stock. This went on for two, or perhaps three days after I discovered it, when, on a sudden, order was restored; as if some cunning old bee, not willing to give up all for lost till he was obliged, had been examining every cell, till at length he had found one containing larva apparently capable of being worked up into some nobler form than that of a common labourer—something worthy of more honour than the general mass of the working classes—and having communicated it to the rest, they desisted from their work of spoliation to try what might be done to save their partly ruined home. From the time I first missed the queen, I was often watching them to see what would be the result, and when I perceived order was restored, I

earnestly hoped to have the opportunity of seeing that which I had only heard of before, viz., the transmutation of a working to a queen bee. My hive is only wide enough for one row of comb, so that I can easily perceive all that is going on. In constructing a royal cell it is commonly done on the edge of the comb, but here, being only one comb, it could not, or, if it could, it would have been useless, as there was no queen to deposit the egg. In order, therefore, to give it the appearance of royalty, and make it commodious for what was going on inside, it was necessary to construct it on the flat surface, about the middle of the comb, over a cell from which was to issue the young princess. This was difficult, as there was barely room between the comb and the glass. Two cells were operated on at the same time, but when it was ascertained that one was going on well the other was abandoned. In due time the young princess appeared. The temporary erections necessary to convert a common cell into a royal one were demolished, the works were repaired, and everything went on as usual, except that the working bees appeared not to pay so much respect to the new as to the old queen. I

imagine that from the circumstances under which she was created queen, she was incapacitated to become a mother, and that the workers being aware of the fact, paid her less attention. There appears to be some departure from the common rule in destroying the royal cell after the birthday, as in ordinary cases several are to be found in the hive. It appears to have been quite out of place here. Before I conclude, allow me to ask two questions of those who are more experienced in such matters than myself. Perhaps some will say, here is plenty to convince any one that it is possible for the working bees to change the larva of the worker into a queen. I am not, however, quite so sure. I wish to ask if there may not be eggs at all times in the breeding season which would become queens, but that they are destroyed if there is no need of them? I also ask, what would have been the fate of these bees the ensuing summer, in consequence of the new queen being barren, and there being no drones in the hive? I should have liked to continue these experiments, but circumstances over which I had no control obliged me to desist.

F. J.

#### CALENDAR OF AGRICULTURE.

Sow turnips in quick succession; finish the sowing of swedes by the middle of the month, and the turnip season, generally speaking, should end with the month. In sowing turnips with artificial manure, as bones, guano, ashes, bran, and rape-dust, use Hornsby's drop drill, which sows two rows and deposits at regular intervals of nine inches the manure and the turnip seed mixed together; this mixture secures a ready food to the young plants. Plough pared and burnt lands with a light furrow, and produce a fine tilth, by means of ample harrowing, before sowing the seed towards the end of the month. If the land be clayey and stiff, sow on the furrow slice, well harrowed; if it be loamy, reduce the land and drill it, which will produce a good commixture of the land and the ashes. Sow rape and cole seed for winter food. Plough lands from which winter tares have been consumed, harrow it well, and sow the seeds in rows by means of a machine with lengthened coulters to make ruts. Sow in broadcast the headlands of the turnip fields, and use short dung, as it is easily covered. Horse and hand hoe beet-root, carrots, and parsnips: allow not one single weed to be seen.

If the potato drills were not rolled after being planted, they may be now harrowed; plough deeply the intervals of the drills, keep the scufflers and hand-hoes constantly going, break all clods, and pulverize the soil very deeply and freely. Fine earths are essential to all root crops.

Continue the feeding, in the yards, of cows and

horses with clovers and vetches; feed them amply, provide abundant littering, and convey the liquid to the tank.

Cut tall weeds from among the grain crops. Allow not any weeds to perfect seeds on pastures, by fences or on roadsides. Many seeds are winged, and are carried by the wind to a distance, and propagate very rapidly.

Finish the shearing of sheep this month; examine the animals closely, as they pass through hands at this time, in the mouth, the shape, the quality of the wool, and the whole general appearance. An inspection of the animals at this time, and the putting upon them distinctive marks, will very much assist the sorting of them for the putting season in October.

Put mares to the stallion every fortnight. Wean lambs by putting them at once beyond hearing the bleat of the ewes, and give them the best grass on the farm.

Hay cutting will commence this month. Ted quickly behind the mowers, cock the grass, spread it out, and cock it again, and carry it to the rick. Employ plenty of hands, at least six to a mower. Turn over clovers in the swathe without tedding, as much shaking loses the leaves, which are the best part of the plant. Put it into large cocks, which may stand in the field for a time. When hay gets damaged by rain, it may be very much recovered by mixing salt in the ricks, 30 lbs. to a load.

## METEOROLOGICAL DIARY.

BAROMETER.			THERMOMETER.			WIND AND STATE.		ATMOSPHERE.			WEAT'R.
Day.	8 a.m. in. cts.	10 p.m. in. cts.	Min.	Max.	10 p.m.	Direction.	Force.	8 a.m.	2 p.m.	10 p.m.	
Apr. 24	29.90	29.60	35	45	41	S. West	brisk	cloudy	cloudy	cloudy	wet
25	29.31	29.50	31	38	37	N. West	ditto	cloudy	cloudy	fine	snow
26	29.64	29.50	32	45	37	N.N.W.	gentle	fine	sun	fine	dry
27	29.84	29.80	32	57	39	N.W., var.	ditto	fine	sun	fine	dry
28	29.86	29.85	34	50	43	East	brisk	fine	cloudy	cloudy	dry
29	29.63	29.62	42	49	42	East	var.	cloudy	cloudy	cloudy	wet
30	29.66	29.80	39	61	47	W. by S.	gentle	haze	sun	fine	dry
May 1	29.91	29.91	39	65	48	E.S.E.	ditto	fine	sun	fine	dry
2	29.90	29.74	42	64	49	E. by South	strong	fine	fine	cloudy	dry
3	29.76	29.90	48	55	52	S. by East	gentle	cloudy	cloudy	cloudy	wet
4	30.05	30.13	49	54	47	E. by North	lively	cloudy	cloudy	cloudy	dry
5	30.16	30.10	40	60	45	E. by North	ditto	fine	sun	fine	dry
6	30.02	29.83	38	49	44	N. East	va. gen.	fine	cloudy	cloudy	dry
7	29.68	29.58	40	40	35	N.N.W.	var.	cloudy	cloudy	cloudy	wet
8	29.58	29.65	32	51	38	W. by South	ditto	cloudy	cloudy	fine	dry
9	29.47	29.47	30	50	38	Westerly	brisk	fine	fine	cloudy	rain
10	29.73	30.06	36	54	40	W. by North	lively	cloudy	fine	cloudy	dry
11	30.10	30.04	32	54	42	E.N.E.	gentle	fine	sun	fine	dry
12	30.04	29.97	32	52	38	E., West	strong	cloudy	fine	cloudy	rain
13	29.94	30.05	44	55	44	S. by East	gentle	cloudy	fine	fine	rain
14	30.05	29.96	42	54	48	East	forcibl.	cloudy	sun	fine	var.
15	29.86	29.76	44	58	48	S.E.	lively	cloudy	fine	fine	dry
16	29.70	29.67	46	63	55	East	ditto	fine	sun	cloudy	dry
17	29.69	29.76	46	60	52	E. by North	airy	fine	sun	cloudy	dry
18	29.87	29.77	48	62	52	E. by North	lively	cloudy	sun	fine	dry
19	29.98	29.98	46	70	58	West	gentle	cloudy	sun	fine	dry
20	30.04	30.07	45	60	47	E. by North	ditto	fine	sun	fine	dry
21	30.10	30.05	38	60	48	Easterly	var.	fine	sun	fine	dry
22	30.09	30.09	43	63	54	E. by North	brisk	fine	sun	fine	dry
23	30.12	30.04	45	64	56	East	ditto	fine	sun	fine	dry

## ESTIMATED AVERAGES OF MAY.

Barometer.			Thermometer.		
High.	Low.	Mean.	High.	Low.	Mean.
30.88	29.16	29.8	70	33	54

## REAL AVERAGE TEMPERATURE OF THE PERIOD.

Highest.	Lowest.	Mean.
55.2	38.66	46.93

## WEATHER AND PHENOMENA.

April 24. Rain for hours. 25. Snowy. 26. Fine. 27. Fine, spring-like. 28. Dark, cutting east wind. 29. Rainy. 30. General change from S.W.

LUNATION.—Last quarter, 30th day, 6 h. 15 m. morning.

May 1. Superb spring. 2. Cold east current, fine, changeable; beautiful circular parhelion. 3. Faintly warm; drenching rain. 4. Totally overcast. 5. Very fine spring day. 6. Cold, biting air. 7. Miserable day. 8. Heavy masses, and clear at intervals. 9. Cold; wet forenoon. 10. Changeable; clouds. 11. Sunny; cold. 12. Rapid change; wet night. 13. Finer day. 14.

Early rain; strong wind. 15. Strong wind; occasional sun. 16. Much wet; heavy, thunder-like masses. 17. Thunder and a shower at 12 last night; this day fine and cold. 18. Perfectly fine. 19. Rather hazy. 20. Keen from the east, cold air; sunny. 21. Beautiful east current; brisk till sundown. 22 and 23. Brilliant brisk current; lulls at sunset.

LUNATIONS.—New moon on the 8th day, 4 h. 6 m. morning. First quarter, 16th day, 5 h. 57 m. morning. Full moon 22nd day, 10 h. 52 m. night.

REMARKS CONNECTED WITH AGRICULTURE.—Though upon the whole cold below the usual average, crops have gradually progressed, and appearances are improved. The cereals are losing the yellow tint, and their verdure increases. The burst of glowing sunshine commencing on the 14th has done wonders, though the forcible eastern current has certainly parched the surface rather suddenly. Grass is very fine; rye and tares are rich, abundant.

J. TOWERS.

Croydon.

## CALENDAR OF HORTICULTURE.

## GENERAL REMARKS.

The late sudden change from cold to comparatively warm and dry weather, by giving an impulse to vegetation, renders corresponding activity necessary on the part of the cultivator of the soil. We, therefore, urge on our readers to put forth all their strength, to keep pace with the rapid progress which vegetation now makes. Everything requiring sowing or transplanting must be done at the proper time and moment, otherwise a loss which can never be made up may be sustained. Weeds, too, especially of the annual kinds, speedily grow and ripen their seeds in dry weather, so as to lay the foundation for a long course of after-annoyance, which the exercise of a little ordinary industry might easily prevent.

## CONSERVATORY.

Frequent damping the floors and other places will be necessary here, in order to keep up that cool atmosphere so grateful to the majority of plants here congregated; besides which, those now placed here will require more than the ordinary amount of water: but we must not be understood to advise that wholesale and indiscriminate drenching which proves fatal to so many things at this season. In fact, the active state that most things are now in renders them more susceptible of the various changes they are subjected to than at other times; and, consequently, large doses of cold water, when not wanted, are more than many plants can bear. It is, therefore, important to bear in mind that plants of the Heath and kindred tribes are more likely to be injured by an improper application of water at this season than if the same thing had been done in February. The comparative state of repose which the plant is in at that time enables it to endure the effect of undue watering, certainly not without injury, but with much less harm than if the same thing were done at this more progressive season. The reason is obvious. The pores or tissue of the plant being now in a condition to absorb so much of what is presented to it, become overcharged, when not allowed to consolidate itself by those periods of partial dryness which ought to intervene between watering. Now these periods ought not to extend so far as to occasion any flagging on the part of the plant, nor yet to cause the soil in which it is grown to assume a perfectly dry condition. In addition to frequently sprinkling the floors, &c., with water, let all plants not in flower have a gentle syringing, which must be so dexterously done as not to injure the flowers, giving also due attention to general cleanliness; and let every appearance of insects be met by the remedies we have before recommended for their extirpation. The Pelargoniums will now be in flower, and will, consequently, form an important feature in plant decoration. Shading to a certain extent will be necessary, in order to keep the plants in bloom any length of time; while the Calceolaria is still more impatient of bright

sunshine: and, in fact, all plants, being propelled on by the influence of sunshine, are correspondingly delayed by its being withheld. For this cause, therefore, all plant-houses are generally more or less shaded at the time the bloom is in its prime.

## FORCING DEPARTMENT.

*Pines*.—Occasional waterings with liquid manure will be of service in encouraging the growth of the successional plants, as well as in swelling the progressing fruit; but it must be withheld long before the latter approaches ripeness; and the last waterings such plants may have must be of plain water alone; for as the quality of the fruit is much influenced by the food administered, it is highly proper that the latter be of a pure and harmless kind. But the growing plants may have it more abundantly, and at the same time accompanied with frequent syringings, which will promote their health, and impart to the atmosphere that grateful moisture which is so essential to good cultivation.

*Vinery*.—The presence of sunshine will assist in ripening grapes much more than fire and other artificial appliances; less attention to the latter will therefore be required. Keep, however, a watchful eye to the health of the plants, and maintain the large leaves unimpaired. Of course syringing cannot well be accomplished when fruit is ripening, but a damp atmosphere will do much to keep away red spider, while at this early season it is not likely to be hurtful to the ripening fruit. Attend to the later houses as recommended in former calendars.

*Peach House*.—Abundant admission of air is now necessary, alike to the ripening fruit, if there be any such, and also to those in a growing state. The later crops may be thinned as they progress. On giving them a final thinning after the stoning process is over, syringe and water as before recommended, and let all long shoots be tied in, &c., &c.

## FRAMING DEPARTMENT.

Much attention is here required in the way of giving and taking away air, and supplying the various occupants of the frame with water when required, &c. Melons will also require stopping and thinning until the necessary number of fruit be set; after that, the maintenance of the fruit usually takes the whole energies of the plant, so that but little useless bine is produced. Water may be liberally given at this period, but withheld entirely as the fruit approaches ripeness. Cucumbers will require copious waterings; and more air may be admitted to them than to Melons.

## FLOWER GARDEN.

The bedding-out season being about brought to a close, collect a quantity of plants of each kind to act as a sort of reserve, to replace such as may be lost by accidents; and these latter being placed in some suitable position, may be kept in pots until wanted; and if they be (as is often the case) the refuse of the lot, time will be given them to grow and strengthen. Many hardy herbaceous

plants will now afford cuttings or slips for propagation, such as the Alyssum sextatile, Phloxes, Heartsease, double Wallflowers, Rockets, &c., which, by being now put in, make excellent plants by the end of summer. Propagate that most beautiful of all lately-imported hardy plants—the *Dielytra spectabilis*—by cuttings, which strike freely now; and it is better to propagate a few of every plant every year, in order to make up deficiencies. Sow also Hollyhock seed, to flower another season.

#### HARDY FRUIT AND KITCHEN GARDEN.

Sow more Beans and Peas, as well as French Beans,

Scarlet Runners, besides the various small crops so essential to keep successions of. Examine the beds of Brocoli, and similar things, that they do not fall a prey to the fly, slug, and other enemies; and give all attention to other crops that may be coming up just now. Plant out Lettuce and Cauliflowers as wanted; and dig any vacant ground as soon as it becomes ready, and destroy all weeds as they appear, removing at the same time all litter or other unsightly matter, so as to present the growing crops to view, not only to the best advantage, but with the certainty of their doing well under such culture. M.

### SALE OF SHORT-HORNS AT BUSHY GROVE FARM, NEAR WATFORD.

On Thursday, the 5th May, this fine herd of cattle was offered for public competition by that veteran auctioneer, Mr. Wetherell, and produced prices which must be highly satisfactory to the owner, Stewart Marjoribanks, Esq. The day proved very fine, the company large and highly respectable, and it was easy to see there were many buyers. The highest price realized was for Rival, a two-year-old heifer, sold to Harvey Combe, Esq., for 150 guineas, after a brisk competition.

#### COWS AND HEIFERS.

Name of Animal.	Purchaser.	Price.
Dowager Queen, roan, calved Oct. 24, 1842	Rev. F. Thursby	30
Songstress, red and white, calved in 1842	Mr. Hollingsworth	22
Raspberry, roan, calved Oct. 9, 1843	H. R. H. Prince Albert	23
Victoria, roan, calved July 15, 1843	Mr. Du Pré	37
Lucy, roan, calved August 18, 1845	Mr. Watson	30
Fairy, calved Feb. 16, 1845	Mr. Hall	26
Cowslip, white, calved in March, 1845	Prince Albert	25
Caroline, roan, calved Feb. 17, 1846	Mr. Harvey Combe	51
Fanny Eliza, red and white, calved May 8, 1846	Prince Albert	28
Patience, roan, calved July 26, 1846	Mr. Ross	20
Ruby, roan, calved in April, 1846	Mr. Faviell	34
Frosty, roan, calved in Sept., 1847	Mr. Abbey	29
Agnes, roan, calved March 30, 1848	Mr. Hall	36
Aurora, roan, calved Nov. 29, 1848	Mr. Mason	27
Azalea, white, calved Dec. 17, 1848	Prince Albert	23
Abess, roan, calved Dec. 18, 1848	Mr. Abley	22
Adonia, roan, calved 1848	Mr. Faviell	37
Cowslip Bell, roan, calved July 26, 1848	Mr. Lawford	23
Faint-Heart, white, calved March 2, 1848	Mr. Chamberlin	25
Rennet, white, calved Dec. 28, 1848	Mr. Torr	40
Gertrude, roan, calved Sept. 26, 1849	Mr. Mason	27
Duchess 3rd, roan, calved in Sept., 1849	Mr. Combe	60
Dotterel, roan, calved Feb. 24, 1849	Mr. Bodger	31
Novelty, roan, calved Aug. 23, 1849	Rev. F. Thursby	24
Primrose, roan, calved in June, 1849	Mr. Longstaffe	41
Mary, roan, calved in Nov. 1849	Mr. Tanqueray	80
Minna, white, calved July 18, 1849	Mr. Faviell	40
Flower, roan, calved in April, 1850	Mr. Powell	28
Anagallis 2nd, roan, calved Jan. 19, 1850	Prince Albert	26
Mary Anne, roan, calved Jan. 27, 1850	Prince Albert	21
Dimity, white, calved Jan. 10, 1851	Mr. Crawley	50
Nonsuch 2nd, roan, calved Jan. 28, 1851	Mr. Powell	23
Sonnet, roan, calved Feb. 27, 1851	Mr. Hall	30
Rival, roan, calved May 6, 1851	Mr. Combe	150
Dairy Maid, roan, calved May 30, 1851	Mr. Longstaffe	61
Anodyne, white, calved July 6, 1851	Mr. Glenmister	18
Annie, roan, calved July 11, 1841	Mr. Whittingstall	23

#### Name of Animal.

#### Purchaser.

#### Price.

Nettle, white, calved July 13, 1851	Mr. Harris	20
Nelly 2nd, roan, calved July 19, 1851	Mr. Powell	20
Careless 2nd, roan, calved July 22, 1851	Mr. Whittingstall	40
Flirt, roan, calved August 8, 1851	Mr. Chamberlin	31
Petulant, white, calved Sept. 16, 1851	Prince Albert	24
Campsey, red, calved Oct. 20, 1851	Mr. Crawley	36
Fuchsia, roan, calved Nov. 17, 1851	Mr. Lawford	23
Rose Gwynne, roan, calved Nov. 30, 1851	Lord Feversham	30
Minna Gwynne, white, calved Nov. 30, 1851	Duke of Sutherland	20
Polly Gwynne, roan, calved Jan. 20, 1852	Prince Albert	35
Graceful, roan, calved April 17, 1852	Prince Albert	33
Lucy 2nd, roan, calved June 1, 1852	Mr. Watson	35
Delight, red and white, calved July 4, 1852	Mr. Torr	30
Countess of Clarendon, red and white, calved July 17, 1852	Mr. Lawford	25
Ada, roan, calved August 31, 1852	Lord Feversham	28
Maggie Lauder, white, calved Feb. 7, 1853	Mr. Fowler	10
Australia, red and white, calved Feb. 8, 1853	Mr. Tanqueray	14

#### BULLS.

Lori Foppington (10437), red and white, calved May, 1849	Prince Albert	53
Bates (11158), roan, calved June 15, 1849	Mr. Hall	23
Fox Manle, white, calved April 28, 1851	Mr. Harris	23
Caffre Jack, red, calved June 8, 1851	Mr. Fletcher	27
Sir Ronald, white, calved April 7, 1852	Prince Albert	40
The Pop, red and white, calved April 30, 1852	Mr. Warrenner	26
Daintie Davie, roan, calved June 25, 1852	Lord Durham	40
Berwickshire, roan, calved Dec. 16, 1852	Mr. Powell	10

#### HEIFER CALF.

Violet, red and white, calved March 31, 1853	Mr. Fowler	14
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#### BULL CALVES.

Fnu, roan, calved March 15, 1853	Mr. Thomas Wilson	5
Paul Fry, roan, calved March 23, 1853	Mr. Fowler	9
Rustic, roan, calved March 28, 1853	Mr. Carrington	31
Total amount of sale	£2,191	7 0
Average of sixty-six head	33	4 0

A capital luncheon was provided. The arrangements for the sale were excellent, and the fine condition in which the cattle were kept excited general admiration, and reflected the greatest credit upon the bailiff, Mr. Tallant. The average of the sixty-six head which were sold exceeded £33 4s., significant enough of the high estimation in which this herd was held.

## AGRICULTURAL REPORTS.

## GENERAL AGRICULTURAL REPORT FOR MAY.

In the early part of the month, and indeed till about the 15th, vegetation in general was in a very backward state, arising from the long continuance of cold weather, aided by sharp north-easterly winds; but, since the latter period, the temperature has become milder and vegetative; hence a great improvement has been noticed in the appearance of the crops. From nearly all parts of England we have received the gratifying intelligence that the young wheats have wonderfully improved of late, and that spring corn is looking remarkably well. We regret, however, to have to confirm our previously-expressed opinions as regards the quantity of land under wheat culture this season. The falling-off in it is certainly from 15 to 20 per cent. compared with last year; consequently, we may readily conclude that the aggregate growth will be considerably less than in 1852. Many parties, taking this statement as the basis of their calculations, have contended that prices will rapidly advance shortly after the close of harvest; but they must bear in mind that there is now little or no difficulty in procuring large supplies from abroad, and at a moderate cost too, to check all apprehensions as to famine prices. The imports of foreign grain having been on a very liberal scale, home-grown produce has been much neglected, and prices of wheat have, consequently, fallen to some extent. Barley, oats, beans, and peas have, however, ruled steady.

The supply of wheat of last year's growth now on hand appears to be greatly reduced, and mostly of inferior quality; whilst that of all spring corn is unusually limited.

It is pretty generally understood that the crop of hay will be a very large one. The appearances of the fields are certainly favourable for a heavy first cut; in fact, it is likely to prove one of the largest on record, should the weather prove fine.

The improved prospects of the agriculturists have been productive of a very active demand for guano; which article has been very scarce and dear, parcels in second hands having realized £11 to £12 per ton. All other manures have commanded more attention, at very full prices.

It is stated, on good authority, that the past has proved an unfavourable lambing season, and that the losses have been seriously extensive. This is

much to be regretted; yet we may observe that the lambs which have made their appearance in the London market have turned out extremely well, both in point of weight and quality.

Some disappointment has been expressed at the comparative inactivity in the demand for wool at the colonial sales. The fact appears to be, that the value of manufactured goods has not risen in proportion to wool; hence manufacturers in general have come to the determination not to increase their stocks, except at previous quotations, which, we may intimate, have been somewhat readily paid. Owing to the want of adequate labour in Australia, the greater portion of the wools now on offer are in very low condition, and somewhat unsuited for our market.

The stocks of home-grown potatoes are now nearly exhausted, whilst the general quality of the samples lately brought forward has proved very inferior. The demand has continued in an inactive state; yet prices of selected qualities have ruled high, viz., from 150s. to 170s. per ton. On the continent the supplies have proved somewhat large, and we have received from France and Holland about 1,800 tons, which have realized from 85s. to 100s. per ton.

In Ireland and Scotland the corn trade has ruled dull, but we have no material change to notice in prices. Both fat and store beasts and sheep have commanded more attention, and the quotations have ruled from 25 to 35 per cent. higher than last year.

## REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Notwithstanding that the supplies of most kinds of fat stock on offer in the leading cattle markets have been considerably in excess of the previous month, the general demand has continued in a most healthy state, and prices have had an upward tendency. The value of most animals, both fat and lean, is now much higher than it has been for several years past; yet we see no reason to anticipate any material decline in it; on the contrary, we are of opinion that there is room for a further advance. The reason for this opinion is obvious. In the metropolis and in the large manufacturing districts the artisans are well employed, and the rates of wages comparatively high; it follows, therefore, that

consumption is increasing, even though the population has been thinned by emigration. Again, it is tolerably clear that the available supplies of live food in the country are inadequate to our present wants, and, further, that those wants cannot be met by the foreigners, so as to have any serious effect upon present quotations. It is clear that every effort is being made by the Dutch graziers to increase their exports to this country; but we perceive that they are turning their serious attention to the improvement of the breeds of both beasts and sheep, in order to make them more suitable for consumption in this country, and we doubt not more profitable to the shippers. Of late some very excellent stock has arrived in London from the Dutch coast, and which has sold at remunerative prices; whilst we perceive that there has been much less anxiety shown to forward only such kinds as are calculated to give a good return. Weight and symmetry are now being studied, and unless the English graziers generally fall in with these views, even the best portion of the trade will be wrested from them. Not that our native breeds have been seriously deteriorated; but it is evident that there is great room for a considerable improvement in them. For a lengthened period, we have condemned the system of disposing of animals in a half-fat state and of unripe age, for the simple reason that we have felt convinced that, at one period or another, their general stamina would become deteriorated, and that a comparative scarcity of food would be the result. That we have not been wrong in our judgment is evident from the trade during the last two or three months. The rapid advance in the value of store animals is calculated to have a checking influence upon production; nevertheless, it may be assumed with safety, that the grazing community has lost none of that energy which they have so long and worthily possessed.

The following are the imports of foreign stock into the metropolis:—

	Head.
Beasts .....	2,852
Sheep .....	8,150
Lambs .....	21
Calves .....	1,857
Pigs .....	127
<b>Total</b> .....	<b>13,007</b>

During the corresponding period in 1852, they amounted to 8,506; in 1851, 9,214; in 1850, 6,060; in 1849, 5,465; in 1848, 7,904; and in 1847, 6,275 head.

The total supplies exhibited in Smithfield have been as under:—

	Head.
Beasts .....	21,346
Cows .....	500
Sheep and lambs .....	122,250
Calves .....	2,041
Pigs .....	2,700

## COMPARATIVE SUPPLIES.

	May, 1849.	May, 1850.	May, 1851.	May, 1852.
Beasts ....	16,320	16,468	19,464	17,839
Cows ....	450	456	460	476
Sheep and ..				
lambs ...	115,340	128,910	133,362	118,034
Calves ....	1,555	1,740	1,855	2,393
Pigs .....	2,193	2,258	2,780	2,655

The arrivals of beasts from Norfolk, Suffolk, Essex, and Cambridgeshire, have amounted to 10,100 Scots and shorthorns; from other parts of England, 2,800 of various breeds; and from Scotland, 1,930 horned and polled Scots—the remainder of the supplies having been derived from abroad and the neighbourhood of London.

## COMPARATIVE PRICES IN SMITHFIELD.

	May, 1850.		May, 1851.	
	s. d.	s. d.	s. d.	s. d.
Beef from ..	2 6	to 3 6	2 4	to 3 6
Mutton ....	2 10	to 4 0	2 6	to 4 0
Lamb .....	4 0	to 5 4	4 8	to 5 10
Veal .....	3 0	to 3 6	3 0	to 3 8
Pork .....	3 2	to 4 0	2 8	to 3 8
	May, 1852.		May, 1853.	
	s. d.	s. d.	s. d.	s. d.
Beef from ..	2 4	to 3 10	3 0	to 4 6
Mutton ....	2 6	to 3 10	3 4	to 4 8
Lamb .....	4 2	to 5 4	5 0	to 6 4
Veal .....	3 0	to 4 4	4 10	to 5 0
Pork .....	2 4	to 3 6	3 0	to 4 4

The demand for skins with the wool on, owing, in some measure, to the inactivity with which the colonial wool sales are progressing, has been less active; yet prices have ruled high, polled skins having realized 11s. each.

From most parts of the country we learn that the health of the stock has continued good, although in some districts the winter stocks of food have been long since exhausted.

For the time of year, Newgate and Leadenhall have been well supplied. Generally speaking, the trade has ruled steady, at very full prices. Beef has sold at from 2s. 10d. to 3s. 10d.; mutton, 3s. 6d. to 4s. 6d.; lamb, 4s. 10d. to 6s. 4d.; veal, 3s. 10d. to 4s. 10d.; pork, 3s. 4d. to 4s. 6d. per 8lbs. by the carcass.

## NORTH EAST OF SCOTLAND.

The first and most important point to be noticed at this season of the year is the advancement of vegetation; and on this head we can have no hesitation in reporting



that everything is late. This has been occasioned, not only by the long-continued snow-storm, which encroached far on the usual season of spring, but by the cold and bleak weather, with frequent frosts of nights, which has prevailed up to this date. Nevertheless, the weather has for some time been dry, and, consequently, the land has been in the best condition for working. Though vegetation has been kept in check, all kinds of out-door labour has proceeded apace. The land was in good condition for receiving the seed during the greater part of the month of April; and, on the whole, the crop was sown down—though at a later period than usual—under favourable circumstances. This much in regard to the crop this season is now evident; that it must either be a light crop, or rather late. It can be made early only by the prevalence of heat and drought to such an extent as to lessen the bulk of the produce. If we have a fair supply of moisture, even with a tolerably favourable temperature during the summer, the harvest must be later than it has usually been for some years past. The sowing of even the latest portions of the turnip fields having been completed some eight or ten days ago, we are now busy in preparing the turnip land. Potatoes have generally been planted within the last ten days. The extent of this crop will be less than usual. This will arise partly from the short supply of tubers for planting, and partly the doubts which the re-appearance and universal prevalence of the disease last year occasion as to the safety of the crop. The usual price at which potatoes are now selling in most parts of this district is from 2s. to 2s. 6d. per imperial bushel. This is considerably more than double of what had wont to be reckoned a fair price in this part of the country. No general scarcity of fodder has prevailed; but the stack-yards are very generally empty, or nearly so. Very little, either of straw or grain, will remain to supplement next year's crop. Straw is commonly sold here by the quarter; that is, by the quantity of straw that yields one quarter of grain. The limited quantities sold in this way have brought from 6s. to 8s., or even 10s., per quarter's straw; the first-named price being what is commonly reckoned about an average in ordinary seasons. Many parties have, within the last few days, sent their young cattle a-field; and the whole stock must now go to the grass very soon. There is scarcely, however, yet a bite for them; and the coldness of the weather is still more trying to cattle newly put out than even the deficiency of herbage. Stock of all kinds have for some time brought, and still continue to bring, high prices. Grass fields have also, we believe, generally speaking, let at high rents. The "feeing-markets," as they are called, are held about this period in the various districts of the country. These markets are attended by almost the entire body of the farm-servants in each district, as well as by their masters, and agreements are entered into for the next half-year. The usual wages paid to good horsemen are from £6 to £8 for the half-year. The half-yearly terms are the 26th May (Whit Sunday) and the 22nd November (Martinmas). The continual changing of servants at these terms, and the necessity—which practice has established—of engaging them at these feeing-markets, are, it must be confessed,

among the *désagrémens* of our business. Nor are the social relations and influences which these practices have rendered prevalent at all favourable to the moral feelings of either of the parties concerned, or calculated to promote that good understanding and those kindly feelings which, for the interest of both parties, ought at all times to subsist between master and servant. The weather continues exceedingly unfavourable to the progress of vegetation; its progress may, indeed, at present be said to be all but entirely arrested. To-day we have had a fierce and cold drought, which, with frost of nights, is withering every green thing.—May 16.

#### WEST OF CLARE, IRELAND.

The backwardness of vegetation noticed in my last report still continues—increased, if not caused, by the dry, harsh, easterly winds universally prevalent. As yet, there is scarcely any growth of grass; and, were it not for the length of the days, one might fancy that it was still March, instead of the proverbially genial month of May. The young potato-stalks have suffered much during the last fortnight from frost; but this is not calculated ultimately to injure the crop, if the season prove otherwise favourable. The oat crop is coming up slowly; and the last of the barley is not yet got in. Dairy-farmers, of whom there are a great many in this district, are complaining loudly of the want of grass for their milch cattle; and many cows belonging to the poorer class, which calved early in the spring, are now losing their milk from the same cause. There is another complaint, the scarcity of heifer-calves in proportion to bull-calves, especially among cows calved within the last month. This is discouraging at present, when the demand and prices for stock of all descriptions exceed anything known since the fall of Buonaparte. In fact, it is difficult to imagine how farmers propose to make a sufficient profit on the cattle for which they are content to pay prices so far beyond the average. No doubt, the quantity of stock in the country was very considerably diminished during the late famine, as large quantities had to be parted with at almost nominal prices, to enable the sellers to procure the necessaries of life at exorbitant rates; and, further, the evictions, deaths, and excessive emigration left a large proportion of land, hitherto in tillage, upon the hands of the proprietors. This land has been since let, in larger farms, to new tenants, who, not finding tillage possible, from the scarcity of labour, nor profitable, from the effects of free trade, are compelled by the necessity of making the rent, and induced by the high price of butter and stock, to convert it into pasture. This in a great measure accounts for the extraordinary demand for black cattle; but we cannot so easily account for the exorbitantly-high prices, and I much fear that many who are now stocking farms will live to repent having so invested their capital. Another change, of a similar nature, has taken place in the letting value of land. The increased value in the Encumbered Estates Court is by no means in proportion to the increase in the yearly rents now readily offered for every farm that becomes vacant. I know an instance myself in which £2 15s. per Irish acre (equivalent to £1 13s. 11½d. per

statute acre) has been offered for by no means prime land, within the last week; and such is the desire to obtain land at any price, that there are no less than sixteen competitors for this farm. In a word, the landed interest was never in a better state, in this part of the country, than at present. The landlords are well off, for their land is all let at well-paid rents; and the tenants are well off, because there is a constant demand, at remunerative prices, for the description of produce to which their attention is now chiefly directed. The only drawback is found in the poor-rates, which are still very high in some places, and must continue so until the present inmates of the workhouses, who are principally orphan children under fifteen years of age, are sufficiently grown to be able to earn their own livelihood. In no part of the kingdom will the benefits of the Chancellor of the Exchequer's recent proposals be so much felt as in the district of which I write. No district suffered so much from the famine; consequently, no district was so heavily burdened with the "consolidated annuities;" while there are so few tenant-farmers paying the requisite amount of rent, that the new income-tax will be only known by hearsay among them. Thus the relief afforded by the abolition of the "consolidated annuities" will be universally felt, while the countervailing burden of the income-tax will be comparatively unknown. To make this intelligible to the English reader, I should perhaps explain that the "consolidated annuities" were a charge upon the poor-rates, which are paid, in the first instance, by the occupying tenant, in every case where the net annual value of his holding exceeds £4; and even where the annual value is below this sum, if he have a lease, of the amount so paid the tenant can deduct but *one-half* from the landlord, when paying his rent; so that, if the "consolidated annuities" were levied, *one-half* of the *entire amount* should have been paid by the occupying tenant. It will thus be seen at a glance what a boon Mr. Gladstone has conferred upon the distressed districts of Ireland. In fact, he has removed altogether a crushing burden from the shoulders of the tillers of the soil, and he has fixed a much lighter burden upon the classes better able to pay it than the struggling Irish peasant. I do not at all wish to comment upon the income-tax *per se*. To do so is out of my province in this report; but I may express my gratification that the introduction of that tax into Ireland should be coupled with so signal an act of justice as the abolition of the "consolidated annuities."—M. F. G.—May 16.

## REVIEW.

### THE POULTRY BOOK.

Orr and Co., Amen Corner, London.

The first part of this eminently practical as well as beautifully illustrated work, is devoted to that very interesting, and at the present time most attractive variety of the poultry family—the COCHIN-CHINA, or as the author demonstrates it more correctly to be, the SHANGHAE breed; the second part will complete this portion of the work. The Poultry Book will comprise the "Characteristics, Management

Breeding, and Medical treatment of Poultry; being the results of personal observation and practice of the best breeders, including Capt. W. W. Hornby, R.N., Edward Bond, Esq., Thomas Sturgeon, Esq., and Charles Punchard, Esq." It is edited by the Rev. W. Wiegfield, Honorary Secretary of the Cornwall Poultry Society, and G. W. Johnson, Esq., Honorary Secretary of the Winchester Society for the Improvement of Poultry. These names at once stamp the character of the work as being *first rate*, and being coupled with the name of Mr. Harrison Weir, who takes from life representations of the most celebrated prize birds, and which are printed in colours under his superintendence, give promise of a something very superior to any work of the kind that has hitherto issued from the press. Besides various well-executed wood engravings of "Her Majesty's Poultry House at the Home Park," designs of poultry yards, &c., vignettes of Mr. Punchard's partridge-coloured Cochins, Mr. Fairleigh's (of Chevely Park) black Shanghaes, Mr. Gilbert's (of Kensington) buff Cochins, we have in Part I. three very finely coloured engravings of Mr. Sturgeon's prize birds, viz., a "white Shanghae cock," bred by Mrs. Herbert, a "buff Shanghae cock," "Jerry," and a buff "Shanghae hen, 'the Queen.'"

## AGRICULTURAL QUERIES.

### LINCOLNSHIRE WOOL AND MUTTON.

TO THE EDITOR OF THE MARK LANE EXPRESS.

SIR,—As one pound of long wool is now worth about three pounds of mutton, can any one of your practical farmers inform me what is the weight of the heaviest fleece of wool ever cut from a Lincolnshire sheep grown in one year? And what is the greatest weight attained by a carcase of the same breed? Perhaps some of your friends in that county can inform me—taking a whole flock of Lincolnshire sheep—how many twos, threes, and fours there are to the tod, part breeding and part feeding sheep? or how many to the tod when all are feeding sheep?—I mean heavy wool sheep, not half-bred Leicesters.

*Bridgewater, May 11. A SOMERSETSHIRE GRAZIER.*

### DIBBLING WHEAT.

SIR,—We are told that  $1\frac{1}{2}$  bushels of wheat are sufficient to plant an acre of land. Can any of the parties who say so inform me how many grains there are in a bushel of wheat, imperial measure, that weighs 62lbs.? If they can, I shall know what distance to dibble wheat to take only  $1\frac{1}{2}$  bushels per acre.

*Hereford, May 9.*

A HEREFORDSHIRE FARMER.

SIR,—Seeing some excellent answers to inquiries about the management of land, in your valuable paper, induces me to inquire of you, or of your correspondents, what treatment would be the most advisable to about fifty acres of land, just drained, and which used to be flooded about six months in the year? Any grass on it is bad, and only fit for litter. It has a strong clayey subsoil, with marl near it. There is a bog in the neighbourhood. Lime can be had reasonably. I want to bring it into grass, and would break it up if necessary.

Your obedient servant,

*Abhoie, Ireland, May 20.*

A BEGINNER.

## ANSWERS TO AGRICULTURAL QUERIES.

### MANGEL WURZEL WITH SPADE CULTIVATION.

TO THE EDITOR OF THE MARK LANE EXPRESS.

SIR,—In your last Monday's journal "A Devonshire Far-

mer" wishes to know the market gardener of great eminence, near the metropolis, who has grown 80 tons of mangel wurzel per acre, when topped, tailed, and well cleaned, the distance from plant to plant, and the quantity of manure he uses per acre, or whether, market gardener like, he had more crops than one in a year. For the benefit of the readers of your journal, I beg to inform the "Devonshire Farmer" that Mr. Charles Bagley, of Fulham, a market gardener of the first magnitude, within the last five years, has grown, and weighed publicly, when topped, tailed, and well cleaned, upwards of 80 tons of mangel wurzel per acre, and sold it to the London cow-keepers at 27s. per ton. I understand he grew about 7 acres of the said mangel. He lays 100 tons of manure per acre per year; and he plants upon the land that is for mangel, after Michaelmas, cabbages, in rows one foot asunder, being 43,560 cabbages upon an acre. Early in the spring, every other row of cabbages, containing 21,780 upon an acre, is taken away, and they are sold in bunches as greens, and a row of mangel wurzel is planted in the place, by the side of 21,780 cabbages upon an acre, being then a row of cabbages and a row of mangel adjoining the cabbages. The cabbages stand until they are fit for market; they are then taken away to make room for the mangel, being one root of mangel in two square feet, alias 24 inches by 12 inches, or 288 square inches for each mangel wurzel. Of course a market gardener of such great discernment would not let a plant be wanting to make up a full crop; at that rate and management there is not a foot of ground lost, very unlike the crops of many farmers. This market gardener occupies about 80 acres of land, a great part of it his own property. I have known him in what they call the gathering season pay £100 a week for labour; and I have seen, not in the busiest time, 50 men labourers leave the gardens to go to dinner, and also with them 25 women, making together 75 people employed upon 80 acres; and I have seen them return again after dinner. I have known this persevering market gardener have two crops in a year, besides a crop of mangel. The first early row of cabbages being taken away, a row of lettuces is planted where they stood, and the mangel wurzel is planted after the last row of cabbages is taken away, getting three crops in one year. There being 21,780 plants of mangel in an acre, to produce 80 tons per acre the plants ought to average 8½ lbs. each, which amounts to a little over 80 tons per acre.

A noble-minded, high-spirited, keen-sighted farmer, a pupil of Mr. Bagley's, produced last year, in a midland county, yellow globe mangel, many roots of which weighed 16, 17, 18, 19, and 20 lbs. each plant or root; and I saw the said roots exhibited in London last Christmas. Mr. Charles Bagley's 80 tons per acre were the long red mangel. A great deal of useful information may be gleaned by the farmers from market gardeners near London, in producing green crops, filling up vacancies, &c., &c.

Roots being the mainstay of good husbandry, it is by the cultivation of them that the Norfolk farmer has spread his fame throughout the world; and Lincoln Heath and the Wolds in Lincolnshire the same; all of which has struck thousands with admiration and amazement to see hundreds of thousands of tons of fine meat produced where only rabbits and vermin existed before; many howling wildernesses brought into fine cultivation, now producing fine crops of corn, turnips, and clover. Mr. Coke, the late Earl of Leicester, used to say the more meat a ploughed farmer sent to Smithfield, the more corn per acre he would be enabled to sell at Mark Lane.

S. A.

Vanhall, Surrey,  
28th April, 1853.

## CROSSING SHEEP.

SIR,—In your paper of last Monday an "Eastern County Farmer" asks, can any of your correspondents inform him whether it would answer for half-bred ewes—between Leicesters and Lincolns—to have put to them next Michaelmas for two years Leicester rams, to follow them two years Down Rams, two years Cotswold rams, and two years Lincoln rams, to get as near as he can the Bakewell frame, the Southdown lean flesh, the Cotswold size, and the Lincoln wool, or as much wool as he can obtain by the said crossing, or whether such crossing sheep has ever been practised? as he says he is endeavouring to produce more wool and meat per acre, and is not nice about similarity, so long as he has plenty of weight of wool and mutton—meaning profit. To be more plain, he intends using Leicester rams, Down rams, Cotswold rams, and Lincoln rams, each of them two years in eight.

I beg to inform the "Eastern County" gentleman that three of the above crosses are in full practice in Buckinghamshire. E. Greaves, Esq., a practical farmer and grazier, at Haversham, near Newport Pagnel, Bucks, has used for a long time two years Leicester rams, two years Southdown rams, and two years Cotswold rams. By the above crossing, he keeps the Bakewell barrel-form, plenty of the Down lean flesh, and sufficient size, which he gains from the Cotswolds. They are very selling sheep in Smithfield, being thick in their lean flesh and strong in their constitutions. A dip of the Lincoln would add, in my opinion, much to the weight of wool. Many of Mr. Greaves' sheep have spotted faces and legs, which the London butchers like.

The following crossing I have proved to answer: One of the old gigantic Norfolk horned rams, with a fine, long, thin, clean head—a sheep that stood thirty-three inches high—put to large Leicester ewes; upon his produce was put a Teeswater ram, with a fine, long, thin head; upon whose produce was put a barrel-formed Lincoln ram; upon whose produce was put a Leicester ram, with a good skin; upon whose produce was put another barrel-formed Leicester-like Lincoln ram, that cut 16lbs. of wool. From this crossing came some very extraordinary sheep—one, a ram, at three-shear cut 16lbs. of wool, when it was making 56s. a tod. This ram weighed, alive, 32 stone of 14lbs., and girtled, when naked, behind his shoulders (in the narrowest part) 5 feet 10½ inches, and stood 32½ inches in height. A wether sheep, at three-shear, weighed 32½ stone, alive, and girtled 5 feet 11 inches near his shoulders when naked. Both sheep were exhibited at Lincoln, Peterborough October Fair, and Leicester, about the year 1819, and were fed near Boston, Lincolnshire. I give this merely to show what judicious crossing will do. If the "Eastern County" gentleman requires a great fleece, would it not be advisable to take two dips of the Lincoln instead of one-fourth? Then he would have two-fifths Lincoln. I am satisfied that some of the best Bakewell Leicester rams that were ever bred have been used in the county of Lincoln. About forty years back, a Leicester ram was hired by four Lincolnshire breeders of Mr. Buckley, of Norwanton, at 1,000 guineas, which was used at Mr. Dudding, of Saxby, or Saxilby, near Lincoln. Mr. Twynham, of Houghton, near Stockbridge, Hants, has been second to no man in crossing, for more than twenty years, with Downs Cotswolds, and kept up his size, weight, and wool.

AN OLD LINCOLNSHIRE GRAZIER.

## GUANO AND NITRATE OF SODA FOR WHEAT AND GRASS.

SIR,—In reply to the query respecting guano, it has been found generally successful in the numerous recorded experiments as a top-dressing both for grass and wheat: 2 to 3 cwt. an acre early in May. For wheat an equal weight of salt is

useful, to check overgrowth and increase the measure and weight of grain rather than straw. And though this is not required in grass, salt is still good in another way, namely, for rendering the herbage sweet and tender and keeping down noxious weeds. It should be spread in damp weather, to diffuse it in the soil. I think salt should be used with guano more generally than is yet the practice.

With respect to nitrate of soda the experiments are more conflicting. Its strong tendency to rank vegetation has often made it increase straw much more than grain, and it would be wrong to apply it where the young wheat is already overgrown from wet or other causes; but in other cases it has been successfully applied early this month, in damp weather, about  $1\frac{1}{2}$  cwt. per acre. As salt has just the contrary tendency, increasing the grain and checking the straw, it is a good corrective, weight for weight (*i. e.*,  $1\frac{1}{2}$  cwt. of each). For all green fodder crops nitrate of soda is unobjectionable, and the juicy rankness of its produce may be corrected by salt, in the same quantities as above. A mixture of 1 cwt. nitrate of soda, 1 cwt. of gypsum, and 10 cwt. of wood ashes per acre, has produced extraordinary effects on weak clover.

On root crops the experiments are discordant, though, upon the whole, favourable. In all cases it should be applied in damp weather, but not in very heavy rain, lest its great solubility should cause it to be washed down. How far it will pay at the present high price is another consideration; but if we can get the crude nitrate, for which efforts are now making, it will no doubt get into extensive employment.

I have delayed this a week, in the hope of a farmer's answers rather than those of a chemist; but the above are founded upon the reports of seven years in the Scotch and English agricultural journals, except the general admixture of salt, which is my own suggestion, it having been but partially tried, so far as appears in the reports. J. PRODEAUX.

#### MANGEL WURZEL.

SIR,—In reply to the query of my countryman, "A Devonshire Farmer," he will find, if memory serves me right, that on writing to Mr. Charles Bagley, of Fulham, he can hear of a produce exceeding 90 tons an acre of roots (manure, heavy quantities of stable-dung), and that Mr. B. was content with that single crop that season; though five successive crops in the year are not unprecedented in Fulham gardening, which is probably unrivalled in the world. J. PRIDEAUX.

#### TWO-YEAR-OLD CART FILLIES.

SIR,—In reply to the inquiry of "A. W. R. F.," I beg to inform him that two-year-old cart fillies of a very large size and a little tender in their constitutions are in a few instances put to the horse in the county of York, as the owners of them consider their bringing a foal is of more value than their labour from two years old to three and a half: of course they require better support whilst breeding and suckling the foal. It may be considered as very little advantage by producing a foal at three years old. A YORKSHIREMAN.

#### IN-AND-IN BREEDING OF LEICESTER SHEEP, AND CROSSING COTSWOLD EWES WITH LEICESTER RAMS.

SIR,—In your Journal of last week, "A Yorkshireman" wishes to be informed who is the most successful in-and-in breeder of Leicester sheep in the kingdom. "I mean," says he, "the person who has bred in-and-in the longest time, and kept up the size, lean flesh, and the Bakewell barrel-form, without degenerating." At the same time, the Yorkshire gentleman begs to know who is the most successful breeder

in crossing Leicesters with Cotswold sheep, to keep up the size, weight, wool, and stamina that the first cross produced.

I beg to inform the Yorkshire gentleman that Mr. Valentine Barford, of Foscoote, or Foscott, near Towcester, Northamptonshire, has bred in-and-in from his own flock—nay, from the nearest affinities—for nearly fifty years; and he has kept up the size, lean flesh, pure Bakewell barrel-form, stamina, vigour, and constitution, without degenerating. I have known his sheep for 45 years, and they have not decreased in size; and I am satisfied they would come to heavier weights now than they would 45 years back. Mr. Barford, being a ram-breeder of great eminence, would be pleased to show his close-bred rams, fed without cake or corn, to any one who disputes it. Mr. B. being a person of great intelligence in breeding sheep, &c., a great deal of beneficial information may be obtained from him in breeding in-and-in &c., being, I conceive, the most successful in-and-in breeder of sheep, of any sort or kind, in the kingdom.

Some people say Mr. Barford's sheep are too little. The Barfordians, *alias* Bakewellites, say, "Size has nothing to do with profit. It is not what an animal makes, so much as what it costs making. The most meat of the best quality per acre, at the least expense per lb., is what every cultivator of land ought to aim at." "Gigantic animals in a lean state," say they, "take a gigantic quantity of food to fill them."

As to crossing little Leicester ewes with gigantic Cotswold rams, to increase the size—that is beginning at the wrong end, because it sometimes causes a great loss in lambing, more especially with the youngest ewes. The better and more successful way is to put gigantic Cotswold ewes to a complete Leicester ram, which has done, and will do, wonders. As a proof, look at the Cotswold Bakewell-formed sheep taking all the prizes for great sheep at the Royal Agricultural show, ever since it began, because they keep the Bakewell barrel-form, with the gigantic Cotswold size. As a proof, Mr. Carpenter, when living near Chipping Norton, bred and fed a Bakewell-formed Cotswold ewe, the year the Royal show was at Cambridge, that weighed 62lb. per quarter. Mr. Carpenter had previously hired Leicester rams of Mr. Hewitt, of Dodford, Northamptonshire. Many years back, the father of the celebrated Mr. Large, of Broadwell, bred and fed a Cotswold sheep, slaughtered and exhibited at Warwick by Mr. Kenrick, that weighed 75lb. per quarter. Mr. Cother has had Cotswold ewes of the pure Bakewell form, slaughtered and exhibited at Banbury, that have weighed upwards of 60lb. per qr. Mr. Hewer, two years back, had a two-shear Cotswold sheep slaughtered and exhibited in Mr. Hardeastle's shop, in King-street, Baker-street, at the time of the Christmas cattle show, that weighed 78 $\frac{1}{2}$ lb. per qr.; and at the Christmas cattle-show, the following year, at Mr. Hardeastle's shop, Mr. Cother had a three years and nine months old male sheep exhibited, that weighed 84lb. per quarter, or 33lb. the carcass.

It is plain the cross of the Leicester and Cotswold has worn ever since the days of the founder of the new Leicester sheep—Mr. Bakewell, the great luminary, whose rays vivified every branch of agriculture they fell upon.

The Yorkshire gentleman may find, at Mr. Bull's, of Drayton Lodge, near Banbury, some fine large Bakewell-formed Cotswold rams—nay, and at a host of other Cotswold ram breeders, too numerous to mention, I have no doubt—as good sheep as the breeders I have mentioned.

I have given you the weights of a few gigantic Cotswold sheep, mixed with the Bakewell blood. But whether great or small sheep are the most profitable, I leave that to the judgement of the readers of your Journal.

I beg further to inform the Yorkshire gentleman that great information may be gleaned by taking monthly the *Farmer's Magazine*. S. A.

Tanball, Surrey, May 4.

## REVIEW OF THE CORN TRADE DURING THE MONTH OF MAY.

The weather has since our last been of a somewhat unusual character for the month of May. After a few fine warm days in the commencement, the wind went to the eastward, and a considerable quantity of cold rain and snow fell in different parts of the kingdom; subsequently the barometer rose, and during the last fortnight we have had a clear sky and bright sun. The days have been hot, but the nights extremely cold; and on the 21st instant the mercury sunk to freezing-point. The drying east and north-east wind which has prevailed has caused a rapid absorption of moisture, and notwithstanding the immense fall of rain early in the spring, the surface of the ground has become hard and dry. The weather, though fine, cannot be considered as having been favourable for vegetation, and the different kinds of grain crops, grass, &c., have not made so much progress as usual in the month of May. The season is certainly backward; but this may perhaps not prove a disadvantage, as the wheat plant would be more likely to have received injury from the cold nights if it had been further advanced. We are sorry to say, however, that the reports from the agricultural districts are not of a very cheering character: all that has been previously asserted regarding the shortness of the breadth sown has been fully confirmed; indeed, there is reason to believe that our former estimate of 15 to 20 per cent. less than in moderately good average years, will be found to be rather under than over the mark. We commence, therefore, with a very serious drawback, and if all the land sown should give a good acreable yield, the produce would still be deficient. The weather thus far has, however, been of a character to give little encouragement to hope that the yield to the acre will be satisfactory. In many districts the plant is exceedingly thin on the ground, not having tillered out well. The long continuance of cold and wet in the spring, and the more recent east winds, have imparted to the blade a yellowish colour, which certainly does not denote health. Very favourable weather in June and July might, no doubt, do much to set matters right; but judging from present appearance, the prospects are not such as to lead to a very sanguine estimate of the probable result of the wheat harvest. That sown in the spring has not prospered well; it was generally got in too late, and neither March nor April proved a genial month.

The sowing of barley and oats, and the planting of beans and peas, were also delayed beyond the usual period, owing to the saturated state of the land in March. A considerable extent of work was, however, completed in a tolerably satisfactory manner in April. Until lately we heard of no complaints respecting the Lent crops, but within the last week or two the accounts have become less favourable, and unless we have some warm rain, mischief may result. Grass lands also stand in need of moisture and increased warmth; but we are inclined to think that the grass crop would be rather productive should these requisites to its growth not be much longer withheld.

The foregoing remarks are the result of pretty extensive observation and careful inquiries among our agricultural friends; but at this period of the year changes are so speedily wrought by a few fine days, that before what we are now writing shall have met the eyes of our readers, circumstances may have occurred to alter the aspect of affairs; but at present the description of the state of affairs will in the main, we think, prove tolerably correct.

The grain trade has not been much influenced by rumours favourable or unfavourable respecting the crops. The foreign supplies have ruled the markets, and these have been on a sufficiently liberal scale to give a downward tendency to prices. By the 1st official account, it appears that the imports into the United Kingdom during the month ending 5th May, amounted in the aggregate to *three-fourths* of a million of quarters of grain and pulse, and upwards of *half* a million of cwts. of flour. Since then the supplies have been, we are inclined to think, at nearly the same rate. Scarcely a day has passed without arrivals off the coast from the Black Sea and Mediterranean ports; and during the last three weeks the receipts from the Baltic and other Northern Continental ports have been on a liberal scale. That prices should therefore have given way, notwithstanding some doubts as to the probable ultimate result of our own harvest, cannot be much wondered at. London has received more than its usual proportion of these immense supplies, and the depression has been greater in the metropolis than at the leading provincial markets; we shall further on give a more detailed account of the transactions at Mark Lane.

That the inferiority of the quality of the last wheat crop was not exaggerated has been abundantly proved. Very little wheat of home growth has come forward, even up to the present time, in fit condition to be manufactured into flour, without a mixture of foreign; and though the receipts of the latter have (as shown above) been very large, there has been no accumulation of stocks anywhere except in London.

In the manufacturing districts consumption has very nearly kept pace with supply, and the probability is that the metropolis will, after a while, have to furnish the northern markets with foreign wheat on rather an extensive scale. The trade altogether may be said to be healthy; and it is pretty plain that any material decrease in the arrivals of breadstuffs would lead to an improvement in prices. The result of the last crop and the prospects for the next cannot be said to warrant the comparatively low rates at present current, but quotations thus far have been kept down by importations from abroad. It may, therefore, be worth while to devote a short space to the consideration whether these are likely to continue on the same liberal scale. As the Black Sea has been the source which has furnished a larger portion of the supply than either America or the Baltic, we shall turn our attention in the first instance to that quarter. That there is no lack of wheat at Odessa, Galatz, &c., is certain; but by the most recent reports from some of the Italian states, we learn that the crops of wheat, &c., had suffered extensively from drought, and the probability is that the Mediterranean will need some of the surplus which the Black Sea would otherwise be in a position to furnish to England. This may not greatly diminish the supply; still it will have some effect. The political differences existing between Russia and Turkey render it by no means improbable that the former country may proceed to hostilities, in which case supplies from the Black Sea might be wholly cut off. This we do not look upon as a likely occurrence; but it is, nevertheless, worthy of consideration. We believe that the Black Sea could furnish supplies of sufficient magnitude to have a considerable effect on the future range of prices here; but, as already stated, there is a probability of a portion of the same being required by other countries besides England, and a possibility of difficulties arising which might interfere with the regular course of business with that quarter.

We shall next turn to the Baltic. By the accounts from thence it would appear that Danzig is nearly the only port at which stocks of wheat to any extent are held, and letters from thence state that prices were comparatively higher in the interior than at that place; hence only small supplies

from Upper and Lower Poland were expected, and holders were consequently not inclined to consign freely to Great Britain. Indeed, a notion appears to prevail very generally on the continent that England will stand in need of larger supplies than usual; the foreign merchants are disposed to speculate on this, but prefer keeping their goods in their own possession, and wait patiently for the anticipated demand.

From Stettin upwards of 110,000 qrs. of wheat have been shipped since the opening of the navigation (nearly all bought on British account during the winter), leaving only about 50,000 to 60,000 qrs. in store.

At Rostock the quantity is still more unimportant; and at many of the near continental ports, including Hamburg, Rotterdam, and Antwerp, the warehouses are almost empty.

If prices should rise here so as to offer a good margin for profit on shipments, supplies would be attracted from the interior of Russia, Prussia, &c., and we should no doubt receive all, or more than required; but we are inclined to think that present rates will not draw very large supplies either from the continent of Europe or from America. On the whole, we are of opinion that the chances are more in favour of a moderate advance than any reduction on the terms now current for wheat.

Business at Mark Lane has, nevertheless, remained in an exceedingly dull state. The supplies coastwise into the port of London have been small, and the quantity brought forward by land-carriage from the neighbouring counties by no means large. Moderate, however, as have been the receipts, a rather important decline has occurred since we last addressed our readers. On the first Monday in the month (2nd inst.) we had fine warm weather, with rather a better display of wheat samples on the Essex and Kent stands than previously. This caused a kind of small panic, and a fall of 1s. to 2s. per qr. The weather subsequently became harsh and cold; still the downward movement was not arrested until the 23rd, a further decline of 1s. on the 9th, and 1s. to 2s. per qr. on the 16th inst., having taken place. Since then the accounts from the country respecting the somewhat doubtful appearance of the growing crop, and other circumstances, have restored some degree of confidence; but up to this period (28th inst.) no part of the reduction (amounting altogether to 4s. or 5s. per qr.) has been recovered.

The arrivals of foreign wheat have been liberal, 78,240 qrs. having been reported during the month. Of this supply the greater portion has been from northern ports. The fresh arrivals from the Baltic brought good prices; but when the receipts began to increase, the fall on English

naturally influenced the value of foreign; and we consider that Silesian, Pomeranian, and similar qualities of wheat, have given way about 4s. per qr. from the highest point. The lowest sale was on the 18th and 20th of the month, when good Stralsund wheat, weighing naturally about 61 lbs., but which the seller engaged to weigh up 62 lbs. per bush., sold at 46s. per qr. Since then the pressure has diminished, and within the last week Mark Lane has been visited by numerous buyers from various parts of the kingdom, expecting to pick up bargains. Finding, however, that holders were not in general disposed to sell so low as before, business has been a good deal checked; still there are indications which lead us to believe that we shall have an increased country demand next month, and that our market will be relieved from the pressure under which it has so long laboured. Black Sea wheat on passage, as well as cargoes arrived off the coast, have receded in value to about the same extent as parcels on the spot. The demand for Ireland has not been so active as it was earlier in the year; still the great bulk of the supply which has arrived off Falmouth and Queenstown has been placed, a portion having been taken for the Channel ports, some quantity for Bristol and that neighbourhood, and a considerable number of the vessels have been ordered round to London. The prices last paid have been 35s. for red Polish Odessa, 34s. to 35s. for hard Taganrog and Berdianski, and 35s. 6d. per qr., cost and freight, for soft Galatz. At these rates it would hardly be possible to buy now, and there are not many cargoes arrived off the coast undisposed of.

The top price of town-manufactured flour has not varied since our last; the sale for the article has been slow throughout the month, country marks and foreign having been offered on relatively lower terms. Norfolk household flour, which was worth 33s. per sack at the close of April, has since been sold at 32s., and in some cases as low as 31s. 6d. per sack. This was about ten days ago; holders have since become less anxious to sell. The arrivals of flour from abroad have been tolerably good, 8,910 sacks and 10,560 brls. having been received at this port. American barrels may at present be quoted from 21s. 6d. up to 24s., according to quality; and there is some disposition to buy at these rates, to hold over.

The supplies of English barley have been so insignificant in extent, and the demand of so retail a character, that it has become a difficult matter to estimate its exact value. Prices of the finer sorts must be regarded as in a great measure nominal, the maltsters having for some time past left off work. Distilling and grinding sorts have been influenced by the arrivals from abroad, and will

be quoted 1s. to 2s. per qr. lower than at the close of last month. Foreign barley has come to hand rather freely. The first cargoes which arrived from Denmark and some of the Lower Baltic ports were readily placed at remunerative rates; 30s. up to 32s. per qr. was paid in the beginning of the month, but these prices were not long maintained, and the decline since then may be fairly estimated at 2s. to 3s. per qr. Opinion appears at present to be rather in favour of a moderate rally, and the article has certainly been held with greater firmness during the last week or ten days. The quantity on passage from the Danish islands is not, we believe, very large, and at many of the continental ports prices are much too high, as compared with those current here, to encourage consignments to England: this, and the idea that the dry weather lately experienced has not been favourable for this crop, has rendered sellers more confident. Egyptian barley has, within the last week or two, met with some attention, there being orders here for this article for shipment to Belgium.

The transactions in malt have been on a retail scale, but holders of the article have remained very firm, and the finer qualities have not been offered cheaper than before.

Supplies of English oats have nearly ceased to come forward, and this grain seems to have become very scarce in all parts of England. The London market has nevertheless been abundantly provided, a fair quantity having reached us from Ireland, and the arrivals from abroad having been on a liberal scale. The effect of this has been that prices have gradually receded; and the entire fall since the close of last month has amounted to 1s. 6d. to 2s. per qr. The dealers have consequently been enabled to get into stock on favourable terms; and should the foreign supplies now decrease (which is not improbable), they will be in a position to realize a fair profit on their purchases. Sweet fresh Danish and Swedish oats, such as were worth 20s. per qr. free on board ship in the beginning of the month, have lately been sold at 18s. 6d., and other sorts at corresponding rates. Within the last week the pressure has not been so great, and we are disposed to think that the lowest point has been passed.

Beans of home-growth have come to hand sparingly, and though the demand has not at any period of the month been active, the tendency of prices has, on the whole, been upwards. The arrivals from Alexandria have been moderate, and the cargoes which have been received have been placed without difficulty at fully previous prices. For Egyptian beans on passage 26s. to 26s. 6d. per qr., cost, freight, and insurance, has been paid within the last week, and sellers now demand a small advance on those rates.

Since the cessation of the seed demand for peas, very little has been done in this article; the supplies have, however, been so trifling, that the few lots which have from time to time come forward have been placed at about former terms.

The inquiry for Indian corn has not been so active as many anticipated a month ago would have been the case, and its value has gradually receded. The depression would probably have been greater if the supplies had been large; but this has not been the case, and the receivers of the cargoes have consequently given way in their pretensions very reluctantly. The business in this article has been chiefly on Irish account; the last sales were at 32s. 6d. per qr., cost and freight, for Galatz, and 30s. per qr. for Salonica arrived off the coast. A more active demand is confidently calculated on, as the consumption is generally large at this period of the year, when potatoes have become scarce and dear.

Though we have already made some allusion to the state of the stocks at the principal foreign ports, we deem it necessary, before concluding, to enter a little more fully into this part of our subject.

The weather appears to have been very similar in character over a great portion of northern Europe to that experienced here—wet and cold in the early part of the year, and dry with east wind during the present month. Spring sowing was delayed to an unusually late period, and the accounts respecting the crops are not of a favourable nature. Wheat is said to be thin on the ground, and backward; and rye is reported to have suffered extensively in some parts of Germany, as well as in Holland and Belgium, from sharp night frosts.

At most of the Baltic ports quotations are relatively higher than in the English market. At Danzig equal to 51s. per qr., free on board, has been recently paid for superior high-mixed, and corresponding rates for other descriptions—say, 48s. for 62 lbs. Upper Polish, and 46s. for Lower Polish of the same weight.

Konigsburg letters, dated little more than a week back, state that the sowing of spring corn had not then been finished—the constant wet up to the end of April having rendered field work very difficult. The weather was then dry, but unusually cold, and the season altogether exceedingly backward. Holders of wheat had shown more disposition to raise than to lower their pretensions, and an advance of about 6d. per qr. had been established on the finer qualities—the best high-mixed samples weighing 62 lbs. per bush, being then worth 45s. 6d., and 62 lbs. red 41s. 6d. per qr., free on board. Freight to London was 4s. 6d. per qr. for wheat. Hardly any supplies of spring corn or pulse had come forward. Peas were quoted at 33s. 9d., and beans 31s. 6d. to 32s. per qr., free on board.

The large shipments of wheat made from Stettin to different ports in Great Britain in April and the first fortnight in May have taken off nearly the whole of the supplies received from the interior, and the most recent accounts from thence state that holders of parcels in warehouse had raised their pretensions. It is quite evident that the Stettin corn-merchants would require little encouragement to be induced to go extensively into wheat speculations. The prices are already relatively higher than those current here, and it would therefore not pay to import from thence. Quotations of all kinds of spring corn are also high there, and more money had been paid for barley for local use than the export houses had been in a position to give.

Rostock letters, of the 24th inst., report a lively demand for wheat, but the prices asked had been too high to admit of the execution of the English orders which had come to hand; for choice heavy samples 45s. to 46s. per qr. free on board had been asked.

At Stralsund, Greifswald, and Anclam, quotations were not quite so high, and good qualities might have been secured at those ports at from 42s. to 43s. per qr. free on board.

At most of the near continental ports, stocks of wheat have been reduced into a very narrow compass; and the value of the article is even higher at Hamburg, Rotterdam, Antwerp, and at the principal ports in France, than in the Baltic. All this is no doubt in a great measure attributable to the belief that Great Britain will require extensive supplies; and if matters should remain quiet here, the foreign merchants would no doubt, after a time, have to lower their pretensions.

The most recent advices from the Mediterranean speak very badly of the crops in some of the Italian states. This, and the threatening position of political affairs between Russia and Turkey, had caused a considerable rise in wheat at Marseilles and some of the other principal ports.

The latest accounts from the Black Sea state that large supplies were expected down from the interior; and if the difficulties between Russia and Turkey should pass over without war, we shall certainly receive large supplies from Odessa, Galatz, and Ibraila.

We have advices of very recent dates from America. Stocks of flour had been considerably reduced at the leading ports by the spring shipments to Great Britain; and as supplies had not come forward so liberally as expected, prices had gradually tended upwards. The exports to Great Britain were beginning to fall off, most of the orders received having been limited too low to allow of their execution.



CURRENCY PER IMPERIAL MEASURE.

	Shillings per Quarter	
WHEAT, Essex and Kent, white, new..	37	42 fine up to 47
Ditto ditto old ..	39	47 " 54
Ditto ditto red, new...	37	40 " 43
Ditto ditto old ..	39	43 " 47
Norfolk, Lincoln, & Yorksh., red..	37	42 " 47
Ditto ditto new ..	32	39 " 41
Ditto ditto white new, none ..	—	—
Ditto ditto old none ..	—	—
BARLEY, malting, new..	30	32 .. Chevalier.. 32 :7
Distilling ..	27	29 .. Grinding.. 26 :9
MALT, Essex, Norfolk, and Suffolk, new	54	55 extra 53
Ditto ditto old 52	54	" 56
Kingston, Ware, and town made, new	59	60 " 63
Ditto ditto old 57	59	" 61
OATS, English feed..	17	21 .. Potato.. 20 :4
Scotch feed ..	21	25 .. Potato.. 23 :7
Irish feed, white ..	17	19 fine 21
Ditto, black ..	16	17 fine 19
RYE ..	28	30 old 28 30
BEANS, Mazaagan ..	33	34 " 31 35
Ticks ..	34	36 " 36 38
Harrow ..	35	37 " 37 39
Pigeon ..	36	40 " 40 44
PEAS, white boilers 37	40..	Maple 33 36.. Grey 30 35
FLOUR, town made, per sack of 280lbs. —	—	" 39 44
Households, Town 40s. Country ..	—	" 35 38
Norfolk and Suffolk, ex-ship ..	—	" 32 33

FOREIGN GRAIN.

	Shillings per Quarter	
WHEAT, Dantzic, mixed..	44	45 high mixed 47 49 extra 55
Konigsberg ..	43	45 " 46 48 " 49
Rostock, new ..	47	49 fine .. 49 " 51
Pomera, Mecklbg., and Uckermk., red	44	46 extra 46 48
Silesian ..	42	41 white 44 47
Danish and Holstein ..	40	42 " 42 44
Rhine and Belgium ..	40	43 old 43 47
French ..	40	42 white 41 45
Odessa, St. Petersburg and Riga..	35	37 fine 39 41
BARLEY, grinding 26	28 ..	Distilling.. 27 30
Malting ..	—	none — —
OATS, Dutch, brew, and Polands 19s., 21s. ..	Feed ..	17 19
Danish and Swedish feed 18s. 19s. Stralsund	19	21
Russian ..	20	21 .. French.. 18 20
BEANS, Friesland and Holstein ..	32	35
Konigsberg ..	31	37 .. Egyptian.. 30 32
PEAS, feeding ..	35	36 fine boilers 38 40
INDIAN CORN, white..	32	35 yellow 32 35
FLOUR, French, per sack ..	34	37 fine 37 38
American. sour per barrel	20	22 sweet 23 25

IMPERIAL AVERAGES.

FOR THE LAST SIX WEEKS.

WEEK ENDING:	Wheat.			Barley.			Oats.			Rye.			Beans Peas.		
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	
April 9, 1853..	44	9	31	4	18	9	31	10	34	5	32	10	3	19	
April 16, 1853..	44	10	31	11	19	0	29	10	34	3	33	7			
April 23, 1853..	44	7	31	5	19	0	27	8	34	9	31	11			
April 30, 1853..	44	4	31	6	18	8	30	0	35	3	33	3			
May 7, 1853..	44	6	31	4	19	0	30	7	35	2	33	3			
May 14, 1853..	44	7	31	5	18	8	29	8	35	5	33	3			
Aggregate average															
of last six weeks	44	7	31	6	18	10	29	10	34	10	33	0			
Comparative avge.															
same time last year	40	11	28	6	19	7	31	7	30	3	29	9			
DUTIES ..	1	0	1	0	1	0	1	0	1	0	1	0			

COMPARATIVE PRICES AND QUANTITIES OF CORN.

Averages from last Friday's Gazette.				Averages from the corresponding Gazette in 1852.			
Qrs.	s.	d.	Av.	Qrs.	s.	d.	Av.
Wheat...	95,448	41	7	Wheat...	94,297	41	5
Barley...	13,893	31	5	Barley...	13,486	28	3
Oats ..	15,090	19	8	Oats ..	16,875	19	10
Rye ..	71	29	8	Rye ..	102	30	0
Beans ..	4,202	35	5	Beans ..	4,667	31	0
Peas ..	502	33	3	Peas ..	461	29	2

PRICES OF SEEDS.

BRITISH SEEDS.

Linseed (per qr.)..	sowing 54s. to 58s.; crushing 45s. to 50s.
Linseed Cakes (per ton) ..	£5 0s. to £9 10s.
Rapeseed (per last) new £22 to £23, fine £24, old £21 to £24	
Ditto Cake (per ton) ..	£4 10s. to £5 0s.
Cloverseed (per cwt.)..	44s. to 61s.
Mustard (per bush) new, white 7s. to 9s., brown 7s. to 9s.	
Corian (per cwt.)..	old 8s. to 12s.
Canary (per qr.) ..	40s. to 42s.
Tares, Winter (nominal)..	Spring, per bush, 4s. 6d. to 5s. 6d.
Caraway (per cwt.)..	new 46s. to 47s.; fine 48s.
Turnip, white (per bush)..	Swede (nominal)
Trefoil (per cwt.) ..	23s. to 28s.
Cow Grass (per qr.) ..	(nominal) .. 00s. to 00s.

FOREIGN SEEDS &c

Linseed (per qr.)..	Baltic, 43s. to 46s.; Odessa, 45s. to 48s.
Linseed Cake (per ton) ..	£7 10s. to £9 10s.
Rape Cake (per ton) ..	£4 10s. to £5 0s.
Hempseed, small, (per qr.) 38s. to 42s., Do. Dutch, 40s. to 42s.	
Tares (per qr.) ..	old, small 30s. to 36s., large 36s. to 42s.
Rye Grass (per qr.) ..	28s. to 35s.
Coriander (per cwt.) ..	12s. to 14s.
Clover, red (duty 5s. per cwt.) ..	46s. to 53s.
Ditto, white (duty 5s. per cwt.) ..	52s. to 68s.

HOP MARKET.

BOROUGH. MONDAY, May 23.

The improvement in our market noticed last week still continues, and fine samples are difficult to obtain, even at a further advance.

Mid and East Kents ..	120s. to 168s.
Wald of Kents ..	115s. " 12s.
Sussex Pockets ..	112s. " 126s.

POTATO MARKETS.

SOUTHWARK, WATERSIDE, MONDAY, May 23.

During the past week the supply has been small, but the great change in the weather has caused the consumption to fall off considerably.

The following are this day's quotations:—

York Regents ..	per ton 130s. to 170s.
Lincolnshire ditto ..	110s. " 130s.
Scotch ditto ..	100s. " 130s.
Ditto Rets ..	90s. " 100s.
French whites ..	70s. " 80s.
Rhenish ditto ..	80s. " 90s.

BOROUGH AND SPITALFIELDS.

These markets are seasonably well supplied with Potatoes as to quantity, but their general quality is inferior. A full average business is doing at our quotations. The imports last week were 444 sacks 79 tons from Dunkirk, 365 tons from Rotterdam, and 150 do. from Hambro'.

York Regents ..	135s. to 180s. per ton
Lincolnshire do. ..	120s. to 140s. "
Scotch do ..	105s. to 135s. "
Foreign ..	90s. to 100s. "

COUNTRY POTATO MARKETS.—LEEDS, May 17:

We had a fair supply of potatoes, which were sold at 1s. 3d. to 1s. 3½d. per score of 21 lbs. wholesale, and 1s. 4d. to 1s. 5d. retail. MANCHESTER, May 17: Potatoes, from 12s. 6d. to 18s. per 252 lb. SHEFFIELD, May 17: Potatoes sold at from 13s. to 17s. per load of 18 stone.

CHICORY.

SATURDAY, MAY 21.

Not the slightest change has taken place in the value of Chicory since our last report. We are without any arrivals either from the continent or the channel islands; nevertheless, the supply is fully equal to the demand.

Per ton.			
Foreign root (d.p.)	£	s.	£ s. £ s.
Harlingen ..	31	0	32 0
English root (free)	£	53	0 40 0
Guernsey ..	13	10	15 15
York ..	14	0	16 0
Guernsey ..	40	0	42 0

Duty on all Coffee and roasted Chicory imported, 3d. per lb.; on Chicory Root £21 per ton.













