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THE  
**Canadian Agriculturist,**

AND

JOURNAL OF THE BOARD OF AGRICULTURE

OF UPPER CANADA.

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VOL. IX.

TORONTO, JULY, 1858.

No. 7.

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THE PROVINCIAL EXHIBITION.

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The arrangements for this great gathering in Toronto are fast approaching completion. The CRYSTAL PALACE is finished, and the fittings up are actively proceeding with. All that now remains to look for is an adequate response from the country, by means of visitors, stock, and material, which it is believed the result will justify. The Show will commence on the 28th September, and terminate, so far as the Live Stock is concerned, on the 1st of October. But it has been determined by the Board of Agriculture to keep open the CRYSTAL PALACE an additional week, in order to give the public ample opportunity of carefully inspecting the numerous productions of Canadian ingenuity and skill, with which the capacious building will abound. Exhibitors therefore are requested to leave such non-perishable articles as they can conveniently, for another week. This arrangement will, it is hoped, prevent the usual over-crowding for a day or two, annually complained of, and afford ample opportunity for our manufacturers, mechanics, and artists, to bring their productions in a favorable manner before the public. The Managers of the Grand Trunk Railway have engaged to take visitors, stock, and articles to and from the Exhibition, for half the usual rates, as long as the show is kept open. The Local Committee have also ascertained that the Great Western and Northern Railways will carry at half rates, as also the Steamboats.

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WEEDS.

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A correspondent states that his ground is much infested with the Burdock, and requests us to give some information on the most effectual means of accomplishing its eradication.

The common Burdock (*Arctium Lappa*) belongs to a class of plants which has generally been regarded by farmers as indicating fertility of soil, where they

naturally prevail. The Burdock is a biennial plant, with a long thick root, which was formerly much used in medicine. In the case of a piece of ground occupied in the main by this weed, a good plan would be to cut off the stems early in the summer, and plough deeply so as to break up the roots, which can readily be brought to the surface and destroyed by a cultivator. By giving the land a clear and deep summer fallow, this pest may readily be got rid of. In case single plants should afterwards spring up, they can, when the ground is moist, be pulled up by the root, in a similar manner to docks and other deep-rooted plants. If the Burdock is not allowed to flower, and its stem cut off near the surface, it must soon perish.

The principal thing a farmer has to do, after getting his land into a clean state of cultivation, is to keep it in that condition,—a matter not very easily accomplished in practice, especially in this climate where annual weeds are so numerous, prolific, and of so remarkably quick growth. For ordinary purposes weeds may be divided into two classes,—those propagated by seed, and others by the root. The former are called annuals or biennials; the latter perennials. The annuals are often found in practice by no means so readily extirpated as the fact of their lasting only one year might lead us to suppose. The seeds of this class are so numerous, and distributed in various ways by different means, that the most vigilant attention of the farmer is constantly required. Winds and birds are the chief agents in their distribution. Hence, the necessity of a whole neighborhood being vigilant in regard to this important matter. One slovenly farmer will in time stock with weeds the clean and well cultivated fields of his neighbors. Perhaps, after all, the most prolific source of weeds is to be sought in the grain and grasses that are usually sown, and the barn manure with which we dress our fields. In this country (and the same remark will equally apply to several countries in Europe), a clear sample of seed grain or grasses is seldom to be procured. Farmers sow the seeds of weeds more or less with every crop they cultivate;—no wonder, then, that we hear such constant complaints of the difficulty and expense of keeping land even tolerably clean. Nothing will effectually accomplish that most desirable object but the employment of *pure seed*, especially if sown in drills, and thoroughly fermented manure.

Professor Buckman, of England, has recently made some careful investigations of these matters, and we will state a few of the results obtained, as they cannot fail, we think, to interest our readers. The Professor found “in a pint of clover-seed 7,600 weed-seeds; in a pint of cow-grass seed, 12,600; in broad clover, 39,440; and two pints of Dutch clover yielded severally 25,560 and 70,400 weed-seeds. Supposing these samples to be sown, here were seed enough to stock the land with weeds for many years. The farmer often goes to the cheapest market and gets weeds for corn, and so pays exceedingly dear for what he considers a cheap bargain.” If this be true, in relation to English farming, how much more so must it be to American, when it is well known much

less pains is taken in preparing grain for market, as well as in the selection of seed and the general cultivation of the soil. In purchasing seed grain, turnip-seed, the grasses, &c., farmers often display a want of judgment and ordinary prudence, by selecting such articles as are cheap, or rather low-priced, for that is not really cheap which is not genuine; and we can conceive no greater pest in an agricultural neighborhood, than "*a cheap seed store,*" in the but too common acceptance of the term.

The fecundity of some weeds is truly astonishing. Professor Buckman has counted 8,000 seeds in a single plant of black mustard, and in a specimen of charlock 4,000 seeds. The common stinking camomile produces 46,000, and the burdock 26,000 seeds; and the seeds of a single plant of the common dock produced 1,700 little docks.

A fruitful source of weeds may often be found in rough, undecomposed barn yard manure. Not only should fermentation in some degree be allowed in the dung heap, in order to effect the necessary decomposition and moisture of its several materials, but great care should be taken that weeds, the seeds of which have become matured, should not be mixed either with the litter of the farm yard or be allowed to enter the compost. Weeds mown thus ripe had much better be burnt; but the proper time for cutting them is before they get into flower, thus obviating the heavy demands which all plants make in maturing their seeds, and of course preventing all chances of propagation. With perennials and such weeds as increase by roots, the only sure and speedy way of extinction is deep and clean cultivation. A well-made, naked fallow, on heavy lands once in five or six years, is even now, in the most advanced agricultural countries, had recourse to for sweetening and clearing the soil, and for bringing it into a perfect mechanical and chemical condition for the profitable growth of crops. This occasional practice, with the introduction of new crops and consequent horse-hoeing tillage during the period of growth, as far as present circumstances will allow, together with a judicious system of rotation and manuring, appears from all experience to be the only sure and profitable way of raising heavy crops of pure quality, and of *preventing*, which is much better and cheaper than *curing*, the growth of weeds.

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### PULPING FOOD FOR CATTLE.

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The changes that have taken place in the mode of feeding live stock within the last thirty or forty years are very instructive; indicating in the most unmistakable manner the progress of science—more particularly chemistry and animal physiology—in its applications to practical agriculture. The old practice of feeding cattle upon uncut hay and straw, and unbruised grain, has for some years been displaced by a far more rational and economical system. • The chaff cutter, many years since, taught the farmer that a mixture of hay and straw cut into short lengths, was far better for horses than when these materials were sup-

plied in the form in which they came from the field. Bruised oats, and other grain, were subsequently found to be better adapted to animals than when whole. Hence the various inventions for cracking or bruising grain by machines of different sizes, adapted to hand, horse or steam power. Of late years experience—the result of the most carefully conducted experiments—has clearly shown that all kinds of cattle-food, hay, straw, grain, and roots, are more nutritious, weight for weight, when finely divided and thoroughly cooked, by the simple process of steaming. The proper relative quantities of raw and cooked food is a matter upon which experience has not yet absolutely decided. A certain proportion of food thus prepared has indisputably been shown to be highly advantageous, not only to horses but also to cattle, sheep and pigs. The boiling of linseed with chopped hay, straw, turnips, &c., till reduced to a sort of jelly, has been practised for years by the best farmers in Britain, for the fattening of cattle, and the practice has been found both efficient and economical.

It is true that the rationale of practices of this nature involves some of the most difficult questions in vital chemistry and animal physiology; and it cannot but be satisfactory to know that the more recent researches and progress made in these sciences, tend to illustrate and confirm the improved systems of breeding and feeding the domesticated animals. It would appear that the advantages of the system of finely dividing, and even cooking, the food of animals mainly consists in diminishing the force necessary for perfect mastication; thereby rendering digestion more rapid and easy, and the material principles of the food thus become more thoroughly absorbed into the animal system. It has been clearly shown that food remains in the stomach only for a certain time when it is subjected to that powerful solvent, the gastric juice; it is afterwards passed into the intestines when only the thoroughly digested portions are, by the process of absorption, converted into blood and muscle.

Refinements in cattle feeding have been carried still further within the last year or two by the invention of what is termed the "Pulping Machine," which has been in use by several farmers in the old country, and we infer from the accounts that have reached us, with much satisfaction. Several of these machines were exhibited at the recent English Show at Chester, when they were subjected to a searching trial. Hitherto it has been deemed sufficient to cut roots into slices more or less fine, according to the kind of animals to be fed. By reducing however the roots into a pulp, not only is the force of mastication reduced to a minimum, but the greatest possible surface of the material is without loss of time, brought into direct contact with the gastric juice.

It may, however, in the present state of our knowledge, fairly admit of a doubt whether there is not a risk of carrying the practice of pulping and cooking food too far. A certain amount of mastication must necessarily be performed by the animals, for which purpose nature has furnished it with teeth; the pulping machine, therefore, should be regarded only as an auxiliary. According to Liebig the chief use of saliva is to absorb the oxygen of the air, which

thus becomes mixed with the food and carried into the stomach, when a still further reduction is effected. Mastication, therefore, not only breaks down the food, but enables the gastric fluid to mix with it the necessary amount of oxygen, that it may be taken up by the absorbents and converted into animal tissue. In giving dry food, such as hay or straw to animals, practice has decided that such as chew the cud—the cow and sheep for example—should have it cut courser than the horse, which is a non-ruminant. This act of rumination would appear to be useful, not only by subjecting the food to a second mastication, but also enables it to obtain more oxygen from the air inhaled by respiration.

It may be well further to observe that although experience has already fully proved that the cooking of cattle food, and we may add, perhaps, the pulping of roots, is an advantageous practice, yet it must not be forgotten that the same experience promotes the necessity of giving daily to animals thus fed a certain quantity of dry fodder such as hay or straw in their usual state. This corrects, as the farmers say, the laxity which a large amount of unmixed succulent food usually produces in the bowels of animals. Indeed, *bulk* has to be considered in regard to food and nutrition as well as quality. The stomach requires a certain amount of food, and no animal will thrive or indeed live for any great length of time or any amount of the essence of food with which it may be supplied. There is much of a curious scientific nature yet to be learnt in these matters, that will be made to have a most beneficial application to practice. And there are few questions possessing a greater money value to Canadian farmers than how to convert in the most effective and economical manner their hay, straw, grain and roots into thriving animals, and flavoury and nutritious meat.

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## SHOW OF THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND AT CHESTER.

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We have been favoured with the following description of this recent national gathering by a young Canadian visitor, who had just arrived in England:—

MANCHESTER, July 27th, 1858.

\* \* \* On Thursday, July 22nd, I went to the Royal Agricultural Society's Show at Chester. I was highly delighted with what I saw; it being the largest and finest show I ever witnessed. Our Provincial Exhibitions in Upper Canada have of late years become very extensive and attended by multitudes of people, but there is this great difference between our shows and those of England, the latter being exclusively confined to live stock and agricultural implements, the usual productions of the farm even not finding a place. In England the division of labour is carried out through all pursuits; manufactures, horticulture, fine arts, &c., has each its separate organization. It will be so in Canada as her resources become developed, and her material and social progress of late years will favourably compare with any country in the world, not even excepting, perhaps, our dear old father land. The country around Chester looks rich and beautiful, and has the appearance of garden-cultivation

It will be a long time before the Canadian landscape can equal it. I can call to recollection, however, several spots in Canada that would look very like England, if they had only those picturesque attractions—green and living fences. Although I am gratified to an indescribable degree with the beauty, richness, and loveliness of the country, I cannot say so much of what little I have yet seen of the cities. In Manchester I was particularly struck with the unseemly conduct of great numbers of people on the Sunday—that sacred day of rest, emphatically the poor man's day. There are all kinds of games going on in back streets and open places; bar-rooms open, people fighting, a continued noise like any other day, and in fact several shops are open. I never knew till I came to Manchester, what life is in a large manufacturing city; a most marked mixture of good and evil. I have already availed myself of the former to some small extent by visiting the Museum of Natural History. The geological department is exceedingly rich, especially in fossil specimens belonging to the carboniferous group. The Horticultural Gardens are a great source of attraction. But I am leaving the object with which I commenced,—a few words about the great show at Chester.

I was, unfortunately, not present at the trial of machines and implements, which occupied two or three days at the beginning of the week. It was understood that the testing was never before conducted in so careful, searching, and scientific a manner, and the report of the committee of this department will be more than usually interesting and instructive. I devoted the Thursday to the inspection of stock, and Friday to the implements and machines; a portion of Saturday I gave to visiting some of the principal points of attraction of the city and its vicinity.

The ancient and usually quiet city of Chester, during the week of the great national show, was the scene of bustle and gaiety. The streets were thronged with visitors, and the royal standard of England, the eagles of France and of Prussia, as well as the banners of other nations, waved proudly and majestically on the ancient walls of this loyal city. The visitor, on entering the city from the railway station, is first attracted by the appearance of a beautifully decorated arch, covered with the laurel, and adorned with banners, bearing the inscription, "Welcome to Chester." In passing from this archway, which so nobly spans the street, to the show ground, the stranger cannot but admire the gaiety of the scene, and the citizens of Chester are deserving of great praise for the enthusiasm which they displayed on this very interesting and important occasion. The show was held in an enclosure called the Rooder, comprising, I should suppose, about thirty-five acres. This piece of land is set apart for the Chester Races, and has a level and beautiful surface. It was in an early period of the nation the arena for the sports of the Roman soldiers, and it is a very curious fact, that the very field which was once covered with the Roman army, and was the play-ground of the ancient Roman games, should now be covered with improved breeds of cattle and agricultural implements, of the latest mechanical improvements.

The general show yard of live stock and implements was opened to the public on Thursday; on the preceding days none but officials, judges, exhibitors, &c., were admitted. Upon paying a fee, however, visitors were allowed to witness the testing of the implements and machinery. From all I could learn, it may be safely affirmed that upon no former occasion was the display of horses, cattle, sheep, pigs, poultry, and implements, so large, or so deserving of praise, as upon the present occasion; and from this it may justly be inferred that British agriculture has made a grand step forward, both in theory and practice. I am inclined to think, however, that the agriculture and stock raising of Canada, during the existence of the Provincial Association,—some ten or twelve years,

I believe,—have made equal, if not greater, progress. This will be apparent when their very backward condition at the beginning of that period is duly considered.

The short-horn cattle were numerously represented, and among them some exceedingly fine specimens, possessing the most essential points and qualities constituting the present state of perfection of this world-renowned breed.—There were some first rate animals of this class at our Provincial shows; but here the vast number possessing superior merit, and evincing the most scientific breeding, was truly astonishing. As a proof that this extensive breed of cattle has not yet arrived at the *ne plus ultra* of perfection, it may be mentioned that some of the most celebrated short-horn breeders who carried off the first premiums of late years,—such as Colonel Towneley, for instance,—had to submit to a subordinate position on this occasion. So severe was the competition in bulls, that the brother of his celebrated “Master Butterfly,” apparently a beautiful animal, obtained only a commendation. It is a fact worth recording, that of the twelve prizes offered by the local committee for the best dairy cows of any breed, *no less than eleven were won by Durhams!* I mention this as worthy of notice, since, judging from a controversy carried on in the pages of the *Agriculturist*, a year or two since, the short-horns, however excellent otherwise, were not generally regarded as good milkers.

The show of Herefords was generally admirable; the number and quality, I was informed, being both superior to former occasions. Some of them appeared too fat for breeding stock. This is, indeed, a beautiful breed, scarcely known, I believe, as yet, in Canada.

The class of Devons was inferior in point of numbers, but among them were specimens, the equals of which are rarely to be met with. And it will not be too much to say, that in them may be seen animals which were an ornament to the show, as well as to the homesteads to which they belonged. Among these splendid animals was a bull, one year and nine months old, exhibited by His Royal Highness the Prince Consort, which was very much admired. The Prince was a competitor in several classes.

Among the other classes of cattle, such as the Angus, West Highland, Alderney, &c., there were some apparently good specimens; but the Welsh breeds occupied the most conspicuous position, owing to Chester being in close proximity to the Principality. Colonel Pennant's herd showed what can be done for these black cattle of the mountains, so superior in point of size and symmetry to the ordinary Welsh “Runts,” as they are called. The number of distinct breeds in the British Isles must be very considerable, and the living forms of several varieties not known on the western side of the Atlantic, strongly reminded me of the striking portraits of British cattle used to illustrate the Agricultural lectures in University College at Toronto.

The display of horses was not considered upon the whole to be equal to that of cattle, and was confined chiefly to animals for draught; some of the dray horses being of immense size and power. The Suffolks and Clydesdales were well represented by some first rate specimens, and seemed to attract the popular approval. It would be difficult, I think, to excel the former for general farm work, and they would well repay a more extensive trial by Canadian farmers. I observed some really good hacks and roadsters, but saw nothing of carriage horses, and doubt whether any were on the ground.

In sheep the show scarcely came up to my very high expectations, although the display was great, and contained numerous animals the like of which I had never seen before. Mr. Jonas Webb, the celebrated breeder of Southdowns, and others in the department of Leicesters, did not exhibit; but the Duke of Richmond, and Mr. Rigden, of Sussex, had some beautifully bred Downs

The Cotswolds, however, were there in great numbers, and gave a decided character to this department of the show. I heard opinions expressed more than once that the Leicesters are declining. The Cotswolds, I think, are destined to attract some attention in Canada and the northern states. The Shropshires were numerously represented, and had many fine animals; they are said to have resulted from crossing with the black-faced sheep of the neighboring Welsh hills. Pigs were extremely numerous, and some of the young sows of the smaller breeds in particular, were perfect beauties. I observed some black Berkshires, spotted with white, but the white colour is decidedly in the ascendant. In this, as well as in the other departments of live stock, there is most satisfactory evidence, when compared with former times, that the farmer has not been backward in keeping pace with the general onward movements of the age. Perhaps at an Exhibition open to the whole kingdom, the collection of poultry was not so large as might reasonably have been expected; but the quality more than compensated for the deficiency in quantity; most of the specimens of the respective breeds were apparently perfect, and elicited general admiration.

The show of implements and machines exceeded my most sanguine expectations, not only in their amount, but likewise in the exquisite finish and great durability of the articles themselves. The price is higher than for American implements of a similar kind; but for efficiency in effecting deep and thorough culture, and durability, no comparison can be instituted. To go into the slightest description of what I was enabled to inspect would be quite impossible in a single letter; so extensive was this department that I could scarcely examine with any care a tenth of the various productions. The steam ploughs and cultivators, of which there were probably a dozen, naturally attracted a large share of the attention and curiosity of the visitors. Those of Messrs. Boydell, Fowler, Smith, and Ricket, appeared upon a practical trial to be the most advanced, and therefore promise best for an introduction to the practical work of the farm.— Not having seen any of them in operation, I can only say that many unprejudiced practical farmers, who had watched their operations with the most assiduous attention, expressed an opinion that it would be a long time yet before they could generally supersede the ordinary plough drawn by horses. Boydell's tractive engine, with its various apparatus, is of immense size and weight, and requires some seven or eight strong horses to move it from place to place. Its power is sufficient to move any implements that may be attached to it,—ploughing at once four or five furrows six or seven inches deep, without difficulty. Fowler's plough is much smaller and compact, and, it is said, makes much better work. The cost of these machines, in the first instance, their unwieldiness, liability to break, the number of skilled workmen required to manage them, and, as yet, the inferior work they make, compared to a skilful ploughman in the ordinary way, all tend against their coming, for a considerable time at least, into general use. The history of mechanical improvement of late, encourages us to hope that the time may come when they will be so far advanced and adapted to practical purposes, that upon all large farms, with suitable fields and surface, they will be generally and economically employed. The amount of portable steam engines for farm purposes, ploughs, harrows, horse hoes, scarifiers, chaff-cutters, drills, &c., &c., was immense, the practical examination of which might well occupy the most advanced farmer and machinist several days. Some new things I could not fully understand. One class of machinery was exceedingly interesting, by means of which grain can be taken in the straw direct from the stack, and at once converted into bread.

G. W. B.

## CHESTER MEETING OF THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

The following statements and calculations relative to the testing of the implements and machines at the Chester meeting, abridged from the *Farmer's Journal* and *Mark Lane Express*, will well repay a careful perusal. It appears that the society subjects the implements &c., brought forward for competition to the most careful and rigid testing every third year. On this recent occasion the trial was continued for an entire week, and seems to have commanded the confidence of both exhibitors and the public :

### STEAM CULTIVATION.

Cultivation by steam has made but little progress since last year at the Salisbury Show. Messrs. Smith and Fowler occupy the same relative positions as heretofore, and the other inventors, with one exception, appear to have merged their inventions in others, or kept them for a time in abeyance.

The general opinion amongst all practical farmers, many of whom had come from great distances to look at the steam-ploughing, was, that something more compact was wanted than anything exhibited in the field. Ropes, tackle, windlasses, snatchblocks, anchors, &c., appeared to many of them to be too complicated, and threatening to be too costly, for effecting cultivation by steam, to really economical results. Eight horses, for instance, have to be employed for the removal of all Mr. Fowler's apparatus, and it takes several hours before the whole can be got into working order. Again, it requires four men and a boy to attend the apparatus properly, and even that number is scarcely enough, for to underman machinery of any kind is anything but economical; and these men ought to be intelligent men, much more so indeed than can be expected, as a general rule, to be found in our agricultural districts. It may, however, be said that the man must be educated up to the machine; and if the latter prove itself an efficient and good working agent, there can be little difficulty in accomplishing this object. Many of the spectators also remarked that the friction of the ropes in wet weather must be enormous; and that, after all, the work done is comparatively inferior, that it is only ploughing indifferently, and that it does not accomplish spade husbandry, which we ought to look for when such a powerful element as steam is applied to the culture of the soil. These views were widely entertained, and, in many instances, openly expressed; nor were they the opinions of men who are the victims of prejudice, and who cling to their habits of ignorance and backwardness with a tenacity of purpose that nothing can relax; for the majority are employing machinery of the best description on their farms, and are desirous of adopting steam in ploughing, when they see their way pretty clearly upon the subject. We need scarcely remark that we have little sympathy with many of these opinions, and simply record them to show the precise phase of the question of cultivating by steam. We have great hopes that in a very short period a machine will be brought out which will have the effect of obviating the few difficulties that still impede the application of steam to the successful culture of the soil.

Messrs. Boydell, Fowler, Smith, and Rickett, were the several exhibitors of steam machinery as applied to cultivation. Mr. Boydell has the same monster engine as he had at Salisbury—wheels, pattens, pinions, &c., precisely the same; doing about the same work, dragging every possible implement after it, and turning angles occasionally that would puzzle an ordinary waggon drawn by horses. The following alterations, however, in Burrell's Boydell engine ought to be noticed, as they show that the first crude idea is being licked into shape by degrees, and possibly may become a standard practical machine. The gear-work for driving both carriage wheels, instead of only one, the new pinion and toothed quadrant steering, instead of the old rudder-chain and pole, and pieces to be attached to the shoes, to guide them and give them a better hold on the ground. There is also an additional force pump, and an extra lifting pump with 30 feet of India rubber suction hose, for supplying the tender with water from roadside streams, or field ditches. The price of the Traction-Tan is £800 or £750 without these extra pumps. The power of Mr. Boydell is manifest; the application of that power is another question. Practical common sense must settle that question. Let us,

however, do justice to this singular invention, and bear testimony to its great traction power. On going out of the yard to the trial ground, the chain connecting the engine with the tender broke, which caused the latter to back with so great an impetus that it upset a van and horse just behind it, but without doing any great amount of injury to either. The engine, with all its apparatus, afterwards ascended a pitched road, with a gradient of one in six, and turned a sharp angle with as much ease as a donkey-cart would, though itself and its tender with water weighed upwards of 22 tons. It then tramped along the high road to a field about five miles distance from the yard, to the astonishment of those who had never seen it before, and the amazement also of several who had seen it upon many preceding occasions. Upon entering the field which was a rich alluvial soil and easily cut, a frame-work of six ploughs, each being independent by leverage action, were attached to the engine, and it turned over the six furrows with the greatest ease, but not with the regularity and working order that good ploughmen like to see. There was, consequently, the usual amount of criticism by the lookers-on, many of whom had never seen a machine of the kind before, and were apprehensive that their occupation like that of *Othello* would be gone were such iron labourers made practically applicable to the culture of the soil.

On another field where the trials took place, Mr. Boydell's iron baby exhibited more than its usual strength, and certainly did some work that has never been equalled in a single operation. With a couple of Cotgrove's subsoilers and two ordinary ploughs it turned up the soil to the depth of from 12 to 13 inches, completely disintegrating it, and leaving the land as though it had been dug by spade-work. The soil was exceedingly hard, and the strength required to break it up and turn it over must have been fully equal to 20 horses at least. Yet the monster engine did it with comparative ease, and created a feeling of astonishment amongst the spectators that is seldom seen, and which was promptly and openly expressed by most of them. With Coleman's eleven-prong cultivator, also, very good work was done, and the implement of whatever kind has only to penetrate the soil, and it is sure to be dragged through, however deep it may be, or however stiff and tenacious the soil. Upon the whole, while the spectators were astonished at the power of the engine, few could bring themselves to the idea of individually applying it in the culture of their farms. It seemed as though it had ran away from a railway station, and was desirous of taking a turn in the fields for the benefit of its health; and were a huge elephant put into a dog-cart, or any other light trap, it would have about the same non-apropos appearance as Boydell's engine has when attached to a plough, or to any other implement employed in the field.

Mr. Fowler's apparatus has undergone considerable change since last year, and is much simplified in its general action. In construction it appears about as slightly a thing as could possibly be desired, and as effective in its working powers as plough machinery, not worked by horse and hand, can be expected to be. A ten horse double cylinder portable engine, with a windlass to attach and detach, and anchor; and four furrow ploughs, with scarifier tines to take the place of the plough mould board, are the general features of the apparatus. The great length of rope which formerly added so much to the wear and tear, and to the loss of power in friction over so many pulleys, has been considerably modified; nor was this the only drawback to the working power of the machine, for the rope was coiled layer over layer, requiring excessive labour to coil it well, which is now completely dispensed with. The rope now used is endless; and the labour of coiling and the risk of its overrunning itself in uncoiling is therefore at an end, and the quantity of rope used is reduced from one-third to one-half of that required by the old plan, either with a travelling or a fixed windlass. The same rope will also bear a much greater strain, as the pull on it is more equal and steady. The wear and tear is much diminished, and where the cartage is bad, two small engines, according to Mr. Fowler, can be used in combination to produce a large horse power, one being at each end of the field. The adjustment also to the length of any field is easily made, as the rope is in lengths and can be joined together, so that a field from 150 to 400 yards long can be worked with comparative facility. The ends of the rope are coiled on two small barrels on the plough, so that any variation required by the crookedness of a fence can be adjusted by the ploughman. The adaptation also of the plough-frame, heretofore used only as a plough, for a scarifier and broadshare, is a great improvement; and the making the disanchor self-moving in a more perfect manner than formerly is certainly another. The tackle consists of windlass, anchor, and plough, rope porters, and about 800 yards of rope, capable of working a 400-yard furrow. The windlasses are attached to the fire-box or smoke-box end of the engine, and

can be detached at pleasure. The whole is simple and light in appearance, and is constructed almost entirely of wrought iron.

Mr. Smith's (of Woolston) apparatus was about the same as we have seen it on former occasions. It consisted of an eight-horse portable engine, made by Clayton and Shuttleworth; a windlass upon a carriage exceedingly simple in its construction, made by Humpries, of Pershore; and anchors, pulleys, snatch blocks, and implements made by Messrs. Howard. The cultivator and scarifier of Mr. Smith, are well known to our readers, both three tined and five tined; and the method of working them by ropes may be thus briefly described. The anchors are iron frames, having strong curved tines, which are drawn into the ground by the strain of the pulleys hooked to them; and the windlass has two drums, with horizontal axles, hung side by side on separate bearings, in a timber frame, strongly constructed, and mounted on four travelling wheels. To keep it in a fixed position, the windlass is linked to the engine by a chain; and the whole is worked by a strap from the engine fly-wheel. In working, when the implement arrives at the headland, the steam is shut off; the pinion in the transverse shaft, being shifted sideways, is out of gear with the drum winding up the rope; and the other drum, which has been paying out rope, is then slipped into gear with it. The whole apparatus is exceedingly simple, and is easily worked. On the first occasion of trying it at Chester, a ridging body of Messrs. Howard was attached to the cultivator, which turned up some excellent work.

Mr. Rickett's rotatory steam cultivator is a new machine. It consists of a ten-horse locomotive engine, with a horizontal shaft behind, driven by pitch chains, and revolving in radial links in the direction contrary to that of the wheels. On the shaft, there are tines or cutters which enter the soil at the bottom of the furrow, cut upwards, and either break up or invert the soil. In one or two mechanical details we consider this machine defective; pitched chains do not work well, having too much friction. The rotatory digger is liable to clog, which brings the engine "up," or stops it; and the digger revolves in an opposite direction to the machine's forward course. The result is that all the cutting action of the digger on the soil has to be overcome by the propelling power of the engine; whereas if the digger revolved in an opposite direction, like a paddle-wheel, it would materially help the work to be done. There are also too many shafts, which crowd the action of the machine; the steering apparatus is like wise defective, which prevents turning easily, so as to begin a new stitch immediately along the one already done. The power used to obtain motion was from 16 to 18 horse; the cylinder  $5\frac{1}{2}$  inches in diameter, with a ten-inch stroke. There was about 90lb. pressure of steam, and the engine goes nearly 200 revolutions per minute. The cutters in revolving struck against the boiler, which ought not to have been the case, had a proper trial been made of the engine before it was sent to the show. We need scarcely remark that the engine stuck fast in the field, to the regret of many, but not to the astonishment of those who know anything of machinery, and who might have safely predicted the results which it produced. Mr. Crawley's set of ploughs, each containing two plough bodies fixed heel to heel, for working up and down the field without turning at the ends, was tried by Fowler's tackle, but failed to do their work in a proper manner.

#### THE TRIALS.

The trials took place in a field at Blacon, where the soil was very hard on the surface and stiffish below, and fully strong enough for testing the working powers of the implements and engines. It was a clover ley, and could not have been broken up for some time preceding. Messrs. Fowler, Mr. Boydell, and Messrs. Howard (working Smith), were the several competitors; and as Mr. Rickett was stuck fast in the field below, the interest of the ploughing from day to day was principally concentrated upon the three named. The work done by Smith's implements was as good as it well could be; and every practical farmer who saw it declared that they should desire nothing better for breaking up the soil, and thoroughly pulverising it and cleaning it of its filth; but there were a great number who preferred to have the soil turned over, and could not realise the idea of perfect cultivation without a thorough inversion of soil. The interest, therefore, gradually settled down, with the exception of one or two marvellous feats of Boydell, upon Fowler's operations.

There is one thing, we believe, clearly established by the trials of steam ploughs fixed in a frame—unless the land is pretty even several portions of it are left untouched, for the implements are too rigidly in a line, and have no independent action to touch

the sunken portions of the inequalities of the soil. These, therefore, in many instances go uncultivated; and as we examined a great deal of the work done by Fowler, we can fully verify this fact. The fields, indeed, must be laid out specially at right angles and even in surface before ploughing by steam, according to the plan of Mr. Fowler, can be effectually done. We must say, however, that the furrow slice was cut much better than we saw it upon previous occasions, and the soil was fairly inverted; but when compared to good horse ploughing it is much inferior at present, and unless it can be done more economically than the latter, all things being considered, the invention is not yet in operation that it is at all likely to supersede the plough, assuming that the practice of inverting the soil is to be adhered to. The following may be considered as a fair summary of the details involved in Mr. Smith's plan, and in that also of Mr. Fowler:—

#### SMITH'S APPARATUS.

An eight-horse ordinary farm engine, sufficient to work all the implements. Windlass and tackle easily shifted from place to place. Anchor sufficiently firm for all useful purposes. This is a kind of safety-valve when the implement chances to strike against a root, or a large stone, as the anchor gives way, and thus prevents the breaking of tackle. The ropes being coiled on a windlass, triangular and crooked fields are as easily cultivated as square ones. The turning bow is arranged so as to turn ploughs, cultivators, harrows, rollers, drills, or other implements. The trenching plough exposes a greater surface to the action of the atmosphere than the common plough, and cultivators can break any strong land, even in the driest weather; a common plough can also be added to the same apparatus. Smith's anchor, and windlass, and plough, exclusive of the engine, is £187, and is therefore within reach of the ordinary farmer. Any repairs necessary can be done by a blacksmith.

#### FWOLER'S APPARATUS

Requires an engine nearly double the power of that of Smith's. Windlass must be separated from the engine for removal. Anchor stands great resistance, but should the implement strike against a root or heavy stone, a break down may likely take place. The rope being endless, necessitates anchor being parallel with engine; therefore crooked and irregularly shaped fields cannot readily be ploughed. Must work all double or two-way implements; even a drill must be so; the weight is thus greatly increased. Plough may be worked upon light land, but cannot work to advantage on clay land, nor can it break up hard dry land of any kind. The price of Fowler's apparatus varies according to the power of the engine employed. If for a seven-horse engine the price is £240; for an eight-horse engine £290; for a ten-horse £468.

(To be Continued.)

#### THE DINNER AT THE CHESTER MEETING OF THE ROYAL AGRICULTURAL SOCIETY, ENGLAND.

The dinner was numerously attended, and several distinguished foreigners were present, among them Mr. Sandford Howard, of the *Boston Cultivator*. We subjoin the greater portion of the eloquent and suggestive speech of the Right Hon. W. E. Gladstone, M. P., a distinguished statesman, merchant, and scholar, which will be read with nearly as much interest on this side the Atlantic as in the mother country:—

The Right Hon. W. E. GLADSTONE, M. P., was received with loud cheers. He said. My Lords and Gentlemen, I am quite sure that I could not fail of addressing what would be acceptable to you this evening if only it were true that the subject with which a man has to deal inspires with it ideas that appropriately belong to it; for you have chosen me, my lord—and it is only in obedience to your commands that I acquiesce in your choice—you have chosen for me an undeserved honor in entrusting me with the charge of proposing to this company that they should drink what every man will drink with the utmost satisfaction and joy—"Prosperity to the Royal Agricultural Society of England" (applause). For this is a toast, my lord, that carries written upon its very brow, the whole of its claims to an enthusiastic reception (applause). A society founded under the highest auspices, a society which invites in its support every class of the community; and which, therefore, is itself among the efficacious means of exhibiting to the world the union of classes, without which there is no strength in any community—

(applause)—and with which every community is irresistible and indestructible; and this society is so founded, and so combines the universal suffrages of the country, directed, as it is, to such a purpose as that of promoting the most essential and the most venerable among all the arts that furnish material for the industry of man (applause).—Whatever else may come and whatever else may go, this at least we know, that no vicissitude of time or change can displace agriculture from the position it has ever held—(Hear, hear)—from the very first state of the generations of man until the last day in the crack of doom itself (cheers). Now, my lord, as one having indeed little claim to address you, but not uninterested in agriculture and its results, I will state in a few words to this company why it is I think we ought to feel grateful to the Agricultural Society for having chosen Chester as the scene of one of its meetings, and for the general prosecution of its labours, with that energy, intelligence, and success that have ever marked its progress. In the first place I take it that it is of the utmost importance to agriculture that it should have the means of recording its ascension and its decline. We must not suppose that because it is an ancient art, and one that has been prosecuted in its simplest forms, it is therefore otherwise than an art which, of all others, perhaps, affords the most varied scope and the largest sphere of development to the powers of the human mind (Hear, Hear). And it is most essential, if, indeed, it be true, as true it is, that a large part of the national welfare hangs upon its prosperity—it is most essential that you should have the best and most efficacious means of comparing its state in one year with its state in another—of recording for future encouragement the progress that has been achieved in the past; and if perchance a time should come when in any one of its branches of enterprise some partial failure should be perceived, that that failure should be noted at the first moment when it becomes visible, in order that the sense of the defect may lead to its being at once repaired (Hear, Hear). My lord, I think it may be truly observed that this—I must say distinguished—I may say illustrious society, appears to me to supply a want which is the greatest inherent want of agriculture. If we look to the case of manufactures, it is their nature to collect themselves in enormous masses around great centres of industry. If we look to commerce, incessant communication between every part of the commercial system of the country is the very vital it breathes, and is naturally inseparable from commercial development. But with agriculture the case is different; for, on the contrary, its nature is to be gathered around local centres, which, under ordinary circumstances, have little or no connection or communication with one another. It is, in comparison, an isolated art, and therefore it might follow, under general circumstances, that agriculture was languishing in various quarters of the country, simply from the want of a knowledge of the progress achieved in other portions of the land. (Hear, hear.) Well, now, if I am right in saying that this is the besetting danger and difficulty of agriculture, is it not true and obvious that the society, whose festival we commemorate to-day, is, by the very principles of its construction, adapted effectually to supply that want—(Hear, hear)—for its business is to bring together the men and the minds of all portions of the country. The stock of Devonshire, the horses of Suffolk, the various products of England, are exhibited in the yards to-day. The agriculture of England, through the means mainly of this society, is rapidly attaining to the position to have but one heart and one mind—one common pulse that causes the circulation of the vital fluid throughout the whole system—one common stock, into which everything that skill, that industry, that intelligence, that capital had achieved in every single part of the country, made the common property of the other portion of the country (applause.) Well, again, my lord, I will venture to give another reason why myself, an uninstructed person, ventured to feel a sentiment of gratitude to those who, in this matter, give us the benefit of their instruction. If we look to the trade of the farmer, it seems to me to stand distinguished from all other trades—not in the less, but in the greater amount of the demand that it makes upon his mental powers. In point of fact, if we are to regard the farmer as an isolated man, he has got to struggle with everything. He ought to understand the whole universe in which he lives, and almost every science that belongs to the entire range of the human intellect. He ought to be profound in meteorology; he ought to be a consummate chemist; he ought to have such a knowledge of birds and animals as scarcely a life could acquire. He ought to be a machinist of the first order; and in point of fact there is no end to the accomplishments which the individual farmer, to be a good farmer, if he stand alone, ought to possess (applause). And if I take the case of two men setting out in life with a

moderate capital at their command—say two men who have £5,000 to dispose of; and the question being whether they are to enter into some ordinary trade, or whether they are to enter into the business of farming, I say that man who takes his £5,000 to stock a farm, which is let to him as a tenant farmer, will require far more of intelligence in order to enable him properly to transact his business than if he opened a shop in some street in a great city (*Hear, hear*). Well now, gentlemen, it is eminently desirable, but you will agree with me that it is not possible, that the farmer should be a profound chemist, an accomplished meteorologist, and the possessor of those other arts which it is desirable he should possess. A pretty good knowledge of some of them he may attain through practice, but he cannot be possessed of every accomplishment necessary. What has he to know of the working of machines? Does not the comparative value of machines turn often on matters of profound calculation? What is he to know of the analysis of soils? What of the manures which he employs? Here, again, comes in the Royal Agricultural Society. The Royal Agricultural Society applies to the machines that are offered to your patronage, the severest test that science has devised. It applies to the manures with which you are to fertilize the ground, those searching analysis which enable you to know with what materials you are dealing; and, in point of fact, in general enables you to prosecute the arduous path of improvement under the safeguards and guarantees of a knowledge which no single individual can possess, but which this society amasses and accumulates, brings to the door of every man, and places therefore at his disposal (*applause*). Well, now, my lord, I think, reasons enough why we should be grateful to the Royal Agricultural Society for having come here to hold its meeting in the ancient and venerable city of Chester. I feel indeed ashamed to be the organ, in any sense, of the sentiments of this neighborhood, when I remember the recency of my own connection with it, and when I recollect that I speak in the presence and in the neighbourhood of those whose families have been rooted to the soil for more centuries almost than I could count years. But, at the same time, I cannot help feeling how appropriately this scene has been chosen for the present anniversary. In this town we meet under the shadow of a venerable cathedral. We meet in a city which derives its name from a denomination established in England 2,000 years ago. But yet we see this ancient city, which has been lately subjected to the influence of change—we see it now becoming the centre of the new traffic—stretching forth the arms of its suburbs right and left, and promising so to flourish and to grow that the Chester of the 18th century will by-and-by be scarcely recognised in the expanded dimensions of the Chester of the 19th. It associates the new and the old—it associates them as they are associated by the Royal Agricultural Society, which, aiming at the improvement of the one great primitive pursuit of man, brings to bear upon the primitive pursuit of every discovery of history—all the patient thought of to-day, all the hope of to-morrow and the future (*applause*.) And let me add this—for I am sure, if there be one cause more than another that has given to this society its place in your universal confidence, it is that which I am about to mention. I have no doubt you love it for the purposes to which it is directed. I have no doubt you rejoice in the union of classes which it exhibits. But, as it appears to me, there is nothing more admirable in its constitution and machinery than that prevailing spirit of publicity and fair play which attends the whole of the proceedings (*applause*.) It has functions to discharge which involve the reward of merit. The reward of merit involves constant comparison of merit. The comparison of merit necessarily grates upon the feelings; and yet, notwithstanding, here is a body which deals with every kind of product of agriculture, and every kind of instrument applicable to agriculture, which yet continues to retain universal confidence—the confidence alike of the victors and the vanquished in their honorable strife (*cheers*). And why is this? It is because its proceedings, like all other agricultural proceedings, pretty nearly, are completely in the face of day. There is no secret about its details. The spirit of secrecy it abhors. Everything that is done is done subject to the free judgment of Englishmen. The judges themselves, who pronounce upon your performances, are judged, in your free, unlicensed, and unrestrained liberty of communication. And the spirit that I believe has, more than anything else, tended to preserve for us the vital power of our public institutions—I mean that of a thorough, and unshrinking, and unswerving publicity—is the spirit which we regard as the guarantee of fairness, and is the spirit to which every proceeding of this society appears to be made to conform. (*Hear, hear*). I cannot help reminding this company with reference to what has fallen from the distinguished Ambassador of France, that he perhaps has done us more than

justice when he speaks of the benefits that the industry of his own country has received from the industry of ours. It is but fair that those acquainted with the history of the commercial, and particularly of the manufacturing progress of this country, should here publicly acknowledge in return for the compliment he has paid you, that it is to Frenchmen, and to the sedulous imitation of what Frenchmen have done, by their taste and skill, that we owe no small part of the rapid progress of the day to the manufacturing prosperity of England (applause). And to you, gentlemen, who know nothing, thank God, of rival interests as between class and class, to you I am sure it will be matter of deep satisfaction if you hear from authority so distinguished and illustrious the assurance that some part of the benefits at least which British manufactures have received from those of France have been repaid and compensated in what France has learned from the industry and skill of the British farmer (applause).

M. de Trebonnais said, the toast I have to propose is, "The Railways." If our age wanted an appropriate emblem to stamp its peculiar character in the annals of history—if a great fact was wanted—who, among the living generations of mankind, would for a moment hesitate to proclaim with grateful and exulting acclamations, the words "railways," a mighty engine of peace, civilization, and progress. Like living arteries, they propel through the land life, judgment, and activity. They equalize the remunerations of our labor and industry by bringing the best markets to the door of our barns and the gates of our paddocks. With the swiftness of lightning, the resistless might of steam, they scatter abroad light, knowledge, and morality. They bring near distant men and things; they throw the broad light of comparisons into hidden corners, and deep-rooted prejudices which, beneath their benign influence, melt like the wintry snow before the beams of the spring sun; and raising our speculations to a more solemn and more exalted sphere, are they not the mighty instruments of God's providence, in promoting grace and good-will among men by fostering general acquaintances and connections between communities, and bringing within the ready reach of our wants and comforts all the treasures and luxuries which nature, the work of his almighty hand, has so bountifully scattered in endless profusion and variety all over the world? If as members of the great human family, we are bound to revere this toast with an enthusiasm commensurate with its merits, are we not more so, as agriculturists, as Englishmen or foreigners, and especially as members of the Royal Agricultural Society?—Without the existence of railways, could the truly magnificent spectacle we now contemplate under the ancient walls of this city, have been displayed to our delighted admiration? Could the vast concourse of people which have flocked from this densely-populated neighborhood, from your blue Celtic hills, and even from foreign lands, have gathered together within the frail enclosure which contains such valuable riches? And lastly, let us contemplate with a moment's thought, the great influence this spectacle cannot fail to exert over the agricultural population of this district—an influence which, without the existence of railways, would have been confined and narrowed into a limited circle (loud cheers).

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## THE PROGRESS OF ENGLISH AGRICULTURE.

(Continued from Page 108.)

In 1798 the Duke of Bedford, Lord Somerville, and others, with Arthur Young as honorary secretary, established the 'Little Smithfield Club,' for exhibiting fat stock at Christmas time, in competition for prizes, with a specification of the food on which each animal had been kept. This society has rendered essential service by making known the best kinds of food, and by educating graziers and butchers in a knowledge of the best form of animal. We smile now on reading that in 1806, in defiance of Mr. Coke's toast, 'Small in size and great in value,' a 'prize was given to the tallest ox.' Length of leg has long been counted a serious fault; for it is the most unprofitable part of the beast. In 1856 a little Devon ox, of an egg-like shape, which is the modern beau-ideal, gained the Smithfield gold medal in competition with gigantic short-horns and Herefords of elephantine proportions; and in 1854 a large animal of

Sir Harry Verney's was passed over without even the compliment of a 'commendation,' because he carried on his carcass too much offal and more threepenny than ninepenny beef.

But the fattening qualities and early maturity of the improved stock would have been of little value beyond the few rich grazing districts of the Midland counties, without an addition to the supply of food. The best arable land of the kingdom had been exhausted by long years of cultivation, and the barren fallow, which annually absorbed one-third of the soil, failed to restore its fertility. A new source of agricultural wealth was discovered in turnips, which, as their important qualities became known, excited in many of their early cultivators much the same sort of enthusiasm as they did in Lord Monboddo, who on returning home from a circuit went to look at a field of them by candle-light. Turnips answered the purpose of a fallow crop which cleaned and rested old arable land; turnips were food for fattening cattle in winter; turnips, grown on light land and afterwards eaten down by sheep which consolidated it by their feet, prepared the way for corn-crops on wastes that had previously been given up to the rabbits. By this means the heaths and wolds of Yorkshire and Lincolnshire, with the help of marling in certain districts, the blowing sands of Norfolk, Nottinghamshire and Bedfordshire, were gradually reclaimed and colonized by the race of farmers who have been foremost to adopt all the great improvements in English Agriculture for the last century. This new system required a capital on the part of both landlord and tenant. It required from the landlord barns and yards and houses fit for first-class farmers. Mr. Coke of Holkham laid out above a hundred thousand pounds in 20 years on dwellings and offices. It required the tenant to expend a considerable sum on flocks and herds, and, above all, in labour for the years before the wild lands began to yield a profit. Mr. Rodwell, in Suffolk, sunk £5000 in merely marling 820 acres, with a lease of only 28 years. Such spirited proceedings demanded no mean amount of intelligence to conduct them with discretion and profit. The value of Mr. Rodwell's produce during the 28 years of his occupancy was £30,000 greater than in the 28 years which preceded his improvements. No needy race of peasant cultivators, no rack-rent absentee line of landowners, could have achieved this conquest over the English wilderness, then far from ports, manufacturing towns, and markets.

This great advance in arable farming took its rise in Norfolk. The king of Brobdignag gave it as his opinion, 'that whoever could make two ears of corn or two blades of grass to grow upon a spot of ground where only one grew before, would deserve better of mankind and do more essential service to his country than the whole race of politicians put together.' This passage might have been written upon Lord Townsend, who retired in 1730 from public affairs, which went on none the worse without him, and devoted the remaining eight years of his life to improving his estate. He originated practices which increased the produce not only two, but a hundred fold, and of which the world continues to reap the benefit at this hour. To marl and clay farms was an old practice in England; for Harrison in his 'Description of Britaine,' in the reign of Queen Elizabeth, says, 'Besides the compost that is carried out of the husbandman's yards, ditches, and dove-houses, or out of great towns, we have with us a kind of white marl, which is of so great force, that, if it be cast over a piece of land but once in three-score years, it shall not need of any further composting.' The usage seems, however, to have died away, and its advantages were rediscovered by Lord Townshend and a Mr. Allen, who applied it to the sands of Norfolk, and converted boundless wilds of rabbit-warrens and sheep-walks into rich, grain bearing soil. Young estimated that before the close of the century 'three or four hundred thousand acres of wastes had been turned into gardens,' and rents

rose from sums between sixpence and two shillings an acre to fifteen shillings and twenty. Many of the tenants realized a capital which amounted to more than the reputed worth of the property. A Mr. Mallett made a fortune in thirty years on a farm of 1500 acres, and bought land of his own of the value of £1700 a year—a more remarkable example even than that of the Scotch proprietor mentioned by Dr. Cartwright, who, being compelled to sell his estate, hired it on a lease, and afterwards repurchased it with the profits he derived from his tenancy.

But marling would not of itself reclaim the Norfolk deserts. Turnips, which are said by Young to have been brought into farm cultivation by the celebrated Jethro Tull, found such a zealous advocate in Lord Townshend, that he got the name of 'Turnip Townshend.' Pope speaks of 'all Townshend's turnips' in one of his Imitations of Horace, published in 1737. This crop he had the sagacity to see was the parent of all the future crops. Without winter food little stock could be kept, without stock there could be little manure, and with little manure there could not be much of anything else. The turnips were, therefore, employed to secure a large dung-heap, and the dung-heap in turn was mainly appropriated to securing the largest possible store of turnips. This tillage in a circle was as productive as it was simple. The ground cleaned and enriched by the root-crop, afterwards yielded abundant harvests of corn; and as we have already stated, the treading of the sheep upon the loose soil, while they fed off a portion of the turnips, gave it the necessary firmness. Thus, through the agency of turnips a full fold and a full bullock-yard made a full granary. Essex and Suffolk soon copied the method, but they did not carry it so far as in Norfolk; and in many places the turnips were never thinned or hoed, upon which their size and consequently nearly all their value depended.

The rotation of crops was, however, considered the especial characteristic of the Norfolk husbandry. Until past the middle of the century no just ideas prevailed upon the subject in any other portion of the kingdom. Sir John Sinclair says all courses were thought to be alike, and deserving neither of praise nor censure. The grand rule of the Norfolk cultivators, to which they steadily adhered, was never to be tempted to take two corn crops in succession. But, in truth, no one part of their system could be dispensed with, and its value was as a whole. They had not only learnt the importance of alternating grain with other products of the soil, but they had ascertained the particular advantage of having the barley follow the turnips, the clover the barley, and the wheat the clover; for the fibrous roots of the latter were the finest possible pabulum for the lucrative wheat, and nothing else would have been equally efficacious. Young found his four course-system widely prevalent in 1767. The principal variation, he says, was in the duration of the clover, which some persons allowed to remain for two or three seasons before breaking it up for wheat. All these changes were brought about in the thirty years from 1730 to 1760, but they were confined, with slight exceptions, to Norfolk itself; and it was not till after Young appeared upon the scene that they began to penetrate into other districts.

After a considerable interval, during part of which Francis, Duke of Bedford was the agricultural leader, another great Norfolk landowner succeeded to the mantle of Lord Townshend. This was Mr. Coke of Holkham, afterwards Earl of Leicester, who, towards the close of the last and throughout the first quarter of the present century, headed the movement. The reclaiming the wastes of Norfolk, the marling the light land, the extensive cultivation of turnips, and the introduction of the rotation of crops, have all been ascribed to him. But as Young, in the *Tours* he published several years before Mr. Coke possessed an acre in the county, states that every one of these practices was then in common use, and constituted the general features of the Norfolk husbandry, it is evident

that this is another of the numerous cases in which the last improver is credited with the accumulated merits of his predecessor. But though the precise nature of what Mr. Coke effected is often misunderstood, the amount of his services has not been overrated. He stands foremost among the class of whom Arthur Young wrote in 1770—'Let no one accuse me of the vanity of thinking that I shall ever by writing, wean farmers of their prejudices: all improvements in agriculture must have their origin in landlords.' Five years afterwards Mr. Coke succeeded to the estates of the Leicester family. The fine house at Holkham, erected from the designs of Kent, about the middle of the last century, bears an inscription which imports that it was built in the midst of a desert tract, and its noble founder was accustomed to say, at once jocularly and sadly, that his nearest neighbour was the King of Denmark. There was still many a broad acre in its primitive state of sheep-walk, and Mr. Coke graphically described the condition of portions of the property surrounding this princely mansion by the remark 'that he found two rabbits quarrelling for one blade of grass.' His first care was to apply the existing methods to fertilising his barren wilds; his second was to improve on the prevailing practices; his third was to persuade his countrymen to follow his example. From the thirty years between 1760 and 1790 both landlords and tenants were content to follow in the track which Lord Townshend had marked out for them—a track which led to such wealth that it is no wonder they were not tempted to further experiments. Mr. Coke roused them from their lethargy, and what Young calls a second revolution, commenced. The great evil of the time was the isolation in which farmers lived. They were nearly as much fixtures as their houses, and what was done upon one side of the hedge was hardly known upon the other. The lord of Holkham instituted his annual sheep-shearing, at which he feasted crowds of guests from all parts and of all degrees. Under the guise of a gigantic festival, is was an agricultural school of the most effective kind, for the social benevolence engendered by such magnificent hospitality disarmed prejudice, and many who would have looked with disdain upon new breeds of stock, new-fangled implements, and new modes of tillage, regarded them with favour when they came recommended by their genial host. Hot politician as he was, according to the fashion of those days, his opponents forgot the partisan in the agriculturist; and when Cobbet, who had no leaning to him, rode through Norfolk in 1821, he acknowledged that every one 'made use of the expressions towards him that affectionate children use towards the best of parents.' 'I have not,' he adds, 'met with a single exception.' The distinguished visitors who came from other counties to the sheep-shearings carried home with them lessons which had an effect upon farming throughout the kingdom.—Excluded by his political opinions from Court favour or office, Mr. Coke may have found abundant compensation in the feudal state of gatherings, at which, as a contemporary journalist records, 'hundreds assembled and were entertained—farming, hunting, or shooting in the mornings—after dinner discussing agricultural subjects, whether the Southdown or the new Leicester was the better sheep—whether the Devon or the old Norfolk ox was the more profitable.\*' In dealing with those who farmed under him, he showed the same wisdom as in his own tillage. He formed an intimacy with Young, and acted upon three of his maxims, on which agricultural progress may be said to depend—that 'a truly good tenant-farmer cannot be too much favoured, or a bad one have his

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\*The Holkham sheep-shearing were evidently arranged by an eminently practical mind; and we have had nothing approaching them at the present day, unless it be in Easter week, a year ago, when Lord Berners, one of the pupils of Coke, entertained a party of farmers, with his tenants and friends, at Keythorpe Hall, where much-needed improvements have been transplanted from Norfolk.

rents raised too high'—that good culture is another name for much labour'—that 'great farmers are generally rich farmers.' By these methods he raised his rental to more thousands a-year than it was hundreds when he inherited the estate, and had enriched a numerous tenantry into the bargain. Swift, in his satirical 'Directions to Servants,' advises the steward 'to lend my lord his own money.' The bailiff of Lord Peterborough pulled down his master's house, sold the materials, and continued to charge him for repairs. The last case was peculiar; but for the steward to grow rich at the expense of an employer who neglected his own affairs was common enough. Mr. Coke was a conspicuous example of the benefit of the opposite practice, for he showed that no profession in the world was so lucrative as that of a landlord who devoted his life to the improvement of his property. The wealth, nevertheless, which accrued to himself was the smallest part of the gain. He was a national benefactor upon a mighty scale, and was the cause, directly and indirectly, of adding a countless mass of corn and cattle, of beef and mutton, bread and beer to the resources of the country.

No discovery, perhaps, in Agriculture was made by Mr. Coke; but he showed a surprising sagacity in singling out what was good in ideas which were not received by the farming public at large, in combining them into a system, and persevering in them until they prevailed. Young states, in his "Report on the Agriculture of Norfolk,"\* which was published in 1804, that Mr. Coke had even then grown the invaluable Swedish turnip for several years with the greatest success, and used large quantities of purchased manure in the shape of rape-cake. Above all, he at that date drilled the whole of his crops, turnips included, and he was the prominent champion of this much opposed system, which is now universally adopted for the time and labour it saves, for the facility it affords for applying the manure directly to the seed, for keeping down weeds and stirring the soil by means of the horse-hoe, and for thinning out the crop with regularity and speed.

The Norfolk farmers, while attending to arable culture, had never turned their attention to improving their stock. One of Mr. Coke's most intelligent tenants said "that bones and offal, rather than meat, were the production of the best grass-lands in the county." A small number of Norfolk or Suffolk cows, good milkers but miserable graziers, were kept, and a flock of the black-faced, long-horned, Norfolk sheep—an active, bony, hardy animal, well suited to pick up a living on the wild bare heaths, and which gave a little wool every year, and a little mutton at the end of four or five. It is just fifty years since Mr. Coke said, in one of his annual Holkham speeches, "that a Norfolk flock had hitherto been considered as little more, in point of profit, than a dung-cart." He soon taught his tenants that, valuable as was manure, they had better keep animals which would at the same time make a return in flesh and fat. His own skill in the difficult art of judging of the qualities of stock was great, and he used to assist his neighbors in parcelling out the ewes to the rams according to the shapes of each, that the defects of one parent might, as much as possible, be remedied by the good points in the other. "I have seen him and the late Duke of Bedford," says Young, "put on a shepherd's smock, work all day, and not quit the business till darkness forced them to dinner."

*(To be Continued.)*

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\* Kent's Survey of the Agriculture of Norfolk was published in 1796; the admirable work of Young appeared in 1804; and in 1844 an able and elaborate report by Mr. R. N. Bacon, the editor of the "Norwich Mercury," gained the prize of the Royal Agricultural Society. These surveys, made at intervals, give an opportunity for comparing one period with another, and throw great light upon agricultural and social progress. They are to be classed among the best kinds of history.

## TREATMENT OF ANIMALS UNDER DISEASE.

## DISEASES OF CATTLE.

(Continued from page 94.)

*Blood-striking* is a determination of blood to the head. The disease is owing to a redundancy of flesh and fat. Its premonitory symptoms are seldom observed, and the remedies, therefore, copious bleeding and active purgation, are seldom taken in time.

*Catarrh* prevails mostly in the spring of the year, when the wind is easterly, particularly if the weather is wet as well as cold. Young animals are more disposed to this, as well as to other diseases affecting the air passages, than older beasts. Treatment.—Housing, with a dry bed to lie on, and some warm bran mashes, with a little nitre in them, will generally put an ordinary case to rights; but in a severe case, attended with inflammatory symptoms, moderate bleeding and a dose of Epsom salts is desirable. A stimulating liniment may be rubbed into the throat, or what is still better, a seton may be inserted. The following will be a desirable liniment to apply to the coarse skins of cattle in this and other diseases where an external stimulant is called for:—

Powdered cantharides.....	1 ounce.
Olive oil.....	6 ounces.
Oil of turpentine.....	2 “

Mix.

*Hoose* is a term given to a disease of the windpipe, to which young cattle, and particularly calves, are subject. The symptoms are a dry husky cough, increased respiration, and followed by great weakness and indisposition to move. These symptoms are caused by the presence of small white worms in the windpipe and bronchial tubes, which keep up constant irritation. The simplest treatment is to administer half a pint of lime water every morning, and a table-spoonful of salt to each calf every evening, continuing these doses for four or five days. The disease has also been treated successfully by giving an ounce of oil of turpentine in four ounces of linseed oil, and repeating the dose once a-week several times. The worms are produced by eggs, supposed to be taken with the water, and it has been caused by keeping the calves on a very bare pasture during the summer months.

*In Inflammation of the Lungs* we have a quick and laborious breathing, in a more striking degree than in the horse, but the pulse is not usually much quicker, and is sometimes full and strong, but more frequently weak. To these symptoms it may be added, that rumination ceases, the mouth feels hot, and the membrane of the nostrils appears red. The treatment of this disease consists of extensive blood-lettings, aperients and febrifuges, and counter irritation. The bleeding should be continued till the pulse falters; from four to six quarts or more may thus be abstracted, and repeated in six hours if the symptoms are not relieved, and the pulse is not too weak. In the horse, we know, it is very dangerous to administer aperient medicine in this disease; but, from the different constitution of the ox, it may be done with advantage.

*Hoove, Hoven, or Blasting*, consists of distention of the rumen, with gas given off by the food, in consequence of its fermentation. The gases thus formed are principally carburetted hydrogen in the early stage, and afterwards sulphuretted hydrogen; and the stomach is very soon distended to an enormous size, and suffocation will follow if relief is not soon afforded. The treatment which suggests itself is to liberate the confined gases, or to condense them by chemical re-agents. The hollow flexible probang, if at hand, should be passed down into the stomach, so that the gas may escape through it, previous or subsequent to which the following draught may be given:—

Powdered ginger.....	3 drachms.
Hartshorn.....	1 ounce.
Water.....	1 pint.

If these medicines are not at hand, some lime water may be given; or, better still, two drachms of chloride of lime dissolved in a quart of water. It is well to follow these medicines by a purgative, in order to restore the digestive organs. Sometimes it is necessary, in order to save life, to relieve the distension by making an incision in the flank, on the left side, between the last rib and the hip bone. If the proper instru-

ments are not at hand, a pen-knife and a quill or stick of elder inserted in the wound will suffice. The wound should afterwards be closed with a stitch and a little plaster.

*Distention of the Rumen* with food, though not usually attended with such acute symptoms in the early stage, is still more formidable, being more difficult to relieve. Treatment.—In mild cases a drench, composed of purgative and carminative medicine, assisted by injections, has proved successful; and in other cases blood-letting has been required. In obstinate cases, it is desirable to inject a considerable quantity of liquid into the stomach, by means of Reed's stomach-pump, so as to produce an evacuation of the contents by exciting vomiting.

*Choking*.—A piece of turnip or a potato being hastily swallowed, becomes impacted in the œsophagus, and thus, pressing on the windpipe at its softest part, interrupts respiration, and, if not removed, often ends in suffocation. A little oil or lard should be administered by the horn, and with which the probang should be lubricated. Use rather a large probang, with a knob at the end, but obliquely, and this, passed along the roof of the mouth, enters the œsophagus. When it has reached the obstructing body, use firm and moderate pressure, no more; alternately raise and depress the head. If it does not easily pass, wait; be not impatient, as the longer it remains the softer it gets. When you again try, you will be surprised to see how quickly it is removed: impatience has been the means of killing scores.

Under the term *Fardelbound* is known a disease which appears to consist in a retention of food in the second stomach, between the numerous plaits of which it is firmly impacted. This disease may be produced by means of narcotic plants taken with the food, or by giving too much food of a dry character, and with insufficient moisture, as well as by other causes which disturb and derange the digestive organs. The treatment consists in the administration of aperients combined with stomachics. Epsom salt, with ginger, afford convenient forms.

*Scourging, Diarrhœa*.—When produced by unwholesome or improper food, a change of diet will sometimes effect a cure; but, if the purging does not cease, the following astringent and tonic may be given:—

Prepared chalk.....	2 ounces.
Gentian, powdered.....	2 drachms.
Opium, powdered.....	$\frac{1}{2}$ drachm.

To be carefully mixed with thick gruel, and given once or twice a day, as may be required. If the animal is very young, a lesser dose will be sufficient. If the liver is affected, we should rely chiefly on calomel, in combination with opium—half a drachm of each being given twice a day. In obstinate cases, it is sometimes prudent to clear out the intestines by means of a dose of salts, and afterwards proceed with the calomel and opium. In sucking calves the symptoms of scouring are often owing to derangement of the stomach, which causes the milk to coagulate there, sometimes forming a large mass, the whey of the milk passing onwards and producing purgation, and the fæces when discharged being of a white colour. These cases are attended with much danger. The treatment consists in the administration of medicine having alkaline properties, so as to dissolve the coagulation and neutralize the acids that probably exist in excess in the stomach. Carbonate of magnesia and carbonate of soda will be desirable medicines, in doses of one or two drachms each, according to the age and size of the calf.

*Redwater* used to be considered as a disease of the kidneys; the dark colour of the urine being supposed to denote the presence of blood. It may be distinguished from disease of the urinary organs, by the absence of any flakes of blood in the urine; and the absence also of that great tenderness of the loins which attends inflammation of the kidneys. It is a disease of the digestive organs, and principally of the liver; the urine being loaded with biliary deposits, which should have passed away by other channels. The symptoms of redwater are, in the first instance, diarrhœa, but soon succeeded by constipation; the appetite is impaired; the pulse and breathing accelerated, and the former weak, with coldness of the extremities and paleness of the membranes. Rumination ceases, and the milk is diminished. The urine is brown, and sometimes becomes black. The disease is most prevalent in or after hot and dry weather, and is produced sometimes by a change from a poor to a rich pasture, and from marshy and cold to dry, sweet, and stimulating pasturage, particularly if in an elevated situation. It is frequent in cows several weeks after parturition. The treatment consists for the

most part in opening the bowels, for which purpose the following draught may be given:—

Sulphate of magnesia.....	12 ounces.
Sulphur.....	4 “
Carbonate of ammonia.....	1 drachms.
Powdered ginger.....	3 “
Calomel.....	1 scruple.

To be made into a draught with warm gruel. One-fourth of the above may be repeated every six hours, without the calomel, until the bowels are relaxed; after which mild stimulants, with diuretics, may be given, such as the following:—

Spirit of nitrous ether.....	1 ounce.
Sulphate of potash.....	2 drachms.
Ginger.....	1 drachm.
Gentian.....	1 “

To be given in gruel twice a-day.

*Retention, or Stoppage of the Urine*, sometimes occurs, and particularly in pregnant cows, from the pressure of the womb on the stomachs. The urine should be removed by means of a hollow tube, called a catheter, and the other symptoms that may attend should be treated accordingly.

*Diseases of the Udder*.—This part is subject to attacks of inflammation, particularly after calving. The part swells, feels hot, the secretion of milk is interrupted, and the part becomes hard. Treatment.—Hot fomentations should, in the first instance, be practised; and if the inflammation is considerable, bleeding from the milk-veins of the affected side should be adopted. A purgative will be also useful: but if the case commences with shivering, then a stimulant, such as an ounce of ginger dissolved in warm gruel or ale, with two ounces of spirits of nitrous ether, will be most useful, and will sometimes at once stop the progress of the disease. After the fomentation, the following ointment may be rubbed into the part:—

Camphor, powdered.....	1 ounce.
Mercurial ointment.....	2 drachms.
Lard.....	8 ounces.

To be well incorporated.

*Quarter-ill* happens to young animals, such as yearling heifers, and is caused by lying on a cold, damp soil, and particularly when there is a hoar-frost. It usually exhibits itself at the early part of winter, and is so rapid in its progress, that an animal quite well the previous evening, is sometimes found dead in the morning. We are rather disposed to think that the part becomes frost-bitten in these very rapid cases. At other times the animal is found with one quarter very much swollen, attended with considerable lameness, and the swelling continues to increase, and soon proves fatal. The course indicated is to bleed in the first instance, unless the pulse is feeble; but, previous to this, a diffusible stimulant should be administered, such as two ounces of spirits of nitrous ether, with a drachm of camphor, and given with warm gruel or water. The part should be well fomented with hot water. The other variety of disease which has received the same designation, happens at a different period of the year, and may be ascribed to a sudden change from poor winter food to rich and luxuriant pasture, which greatly increases the supply of blood. It often attacks two-year old cattle, and is most prevalent in the spring of the year. Bleeding, to a large extent, should be practised as soon as possible; after which the bowels should be opened, and the part well fomented. Prevention, in these cases, is better than a cure, and it is certainly far easier, and more particularly in the first-mentioned disease. By housing the young animals at night, or at any rate putting them in sheltered yards before the winter comes on, we shall do much towards the prevention of this disease; and, in addition, liberal dietetic treatment will be of great assistance. The use of oil-cake has been found to conduce materially in warding off this disease. So likewise with regard to that which proceeds from an excess of blood, by gradually changing the pasture, so as not to run from one extreme to another, the disease may often be prevented.

The *Epidemic* is ushered in by a cold fit, with a staring coat and cold extremities, which is soon followed by a reaction, in which the extremities become warm, a discharge of saliva is observed from the mouth, and on examination the tongue is often found swollen; the beast appears tender in the feet, and feverish symptoms are

manifested; the pulse being quickened, and the muzzle feeling dry and hot. In the course of the first day, vesicles or bladders are found on the tip and upper part of the tongue, as well as other parts of the mouth, the lips, and between the hoofs and the heels, and in milch cows the teats are often similarly affected. The general treatment of the disease consists in moderating the fever, relaxing the bowels, applying astringents to the mouth and feet, and afterwards, if necessary, supporting the strength by tonics. A dose of salts, with a little sulphur, will be a convenient aperient, and the tonic, when necessary, may consist of gentian, ginger, and sulphate of iron, two drachms of each. A solution of alum, with a little treacle, will be a useful application to the mouth, and the feet may be dressed with a simple astringent powder, or a stronger caustic, according to the state of the parts. If the udder is affected, local bleeding and fomentations will be called for; and if the liver or lungs are involved, the treatment should be modified accordingly.

*Pleuro-Pneumonia.*—A very slight but short cough, and a little starting of the coat, are the earlier tokens of a departure from health, and may run on for weeks in this state. Then, with an increase of these symptoms, we may notice that the affected beast lags behind the herd, and does not feed so readily as before. This may be considered as the first stage. After some time we find the breathing greatly accelerated, the animal loses flesh, and often with great rapidity, and the appetite is further diminished, and now the attendants are alarmed, and begin to think something serious is the matter. We may call this the second stage, to distinguish it from the third or latter stage, in which the most urgent distress is manifested; the animal is greatly reduced, the appetite failing almost entirely, and rumination also ceasing; respiration is greatly accelerated, short and catching, the beast, indeed, pants for breath, and soon dies from suffocation. Treatment.—If the herd is large, and only one or two animals appear to be affected, slaughter them at once. It is in the first stage, whilst merely the short husky cough and the starting coat are apparent, that treatment may be instituted with a fair probability of success. A moderate blood-letting may be given, but it must neither be large nor repeated. Blister, by rubbing into the sides, previously stripped of hair, the ointment of iodine of mercury, and of tartarized antimony, and the ointment of cantharides, mechanically combined; and if we wish to render it still more stimulating, we may add a little croton oil. We may also insert a large seton in the dewlap, with the view of taking up and continuing the counter-inflammatory action after that of the blister has ceased. With regard to internal remedies, we may first regulate the bowels by means of Epsom salts and linseed oil, and then administer the following sedative, respecting which experience enables us to speak most favorably:—

White hellebore, powdered. . . . .	1 drachm.
Tartarized antimony. . . . .	1 “
Nitrate of potash. . . . .	2 drachms.

This powder may be mixed up with gruel, and given morning and evening the first day, and once a-day afterwards, continuing the medicine for about four or five days. Bran and linseed mashes may be given; indeed linseed, either in the form of crushed seed or cake, is a very desirable food for an animal either suffering under, or recovering from, this complaint.

*The Drop* after calving, as it is usually termed, is one of the most annoying diseases to which our dairies are liable. One of the symptoms is a torpid state of the stomachs and bowels, rumination ceases, and the food in the various stomachs remain in an unchanged state. Our first object must be, then, to restore this loss of action by means of purgatives and stimulants, and it is surprising what a vast quantity of medicine the cow, in the acute and severe variety of this disease, can take with impunity:—

Take sulphate of magnesia. . . . .	1 pound.
“ flowers of sulphur. . . . .	4 ounces.
“ croton oil. . . . .	10 drops.
“ carbonate of ammonia. . . . .	4 drachms.
“ powdered ginger. . . . .	4 “
“ spirit of nitrous ether. . . . .	1 ounce.

The above should be carefully mixed and dissolved in warm oatmeal gruel, and given to the cow slowly and carefully. In particularly severe cases, and where there is obstinate constipation, the croton oil may be increased, and from four to eight grains of powdered cantharides may also be added. A strong stimulating or blistering liniment

should be rubbed on the spine, particularly on the loins, and a fresh sheep skin may be afterward placed on the loins, the woolly part outside. Every six hours, one fourth of the above medicine, with the exception of the croton oil, should be given, until purging is produced, which may be facilitated by raking and clystering. If the cow cannot or does not pass her urine, it should be removed from her by means of the catheter. Plenty of nourishing gruel should be given, and bran-mashes and other foods offered. In the milder form of the disease, the medicines we have advised should be administered, or rather repeated, with somewhat greater moderation. In order to prevent the disease, in-calf cows should have plenty of moderate exercise, shelter from the weather, and moderate feeding. The natural grass of the field, during the summer and autumn, and oat-straw, with a little hay, and a few roots in the winter, will be sufficient; but this must be regulated by the condition of the cow—she should not be allowed to make too much flesh. At the same time, protection from the weather should be afforded, and care taken that the cow is not worried by dogs, or allowed to leap her fences.

**Abortion.**—When abortion takes place at a very early period of pregnancy, there is usually but little disturbance of health, and treatment is rarely required. At a late period, however, the disturbance is great, and serious consequences sometimes follow, such as inflammation of the womb, and even death. It is advisable, when treatment is required, to give a dose of salts to relax the bowels, and it may be followed by a sedative, such as an ounce each of laudanum and spirit of nitrous ether. When there is inflammation of the womb, hot fomentations should be applied externally to the loins for a long time together, and warm water should be gently syringed into the blood. Some blood may also be abstracted. When abortion is threatened, it sometimes happens that it may be prevented by prompt treatment. The animal should be bled, kept quiet, and one and a half ounce of tincture of opium, and a similar quantity of spirit of nitrous ether should be given, but purgatives avoided. When a cow has aborted before at a particular period, it is prudent to abstract some blood just previous to this time. It generally happens that the after-birth is retained after abortion, and it is better to remove it, if possible, although it be necessary, in order to accomplish this, to introduce the hand into the uterus, and detach the placenta from it, by breaking down carefully the points of attachment.

**Diseases of the Skin.**—*Mange* is produced either by poverty or contagion. The treatment consists in rubbing in, with plenty of friction, an ointment containing sulphur, such as the following:—

Sulphur vivum.....	1 ounce.
Linsced oil or train oil.....	8 “
Oil of turpentine or oil of tar.....	2 “
Mix.	

*Lice* occasionally infest cattle that have been reduced by poverty of living, and prove a source of much irritation, though not to the same extent as the mange. Either the ointment recommended for mange, or a decoction of tobacco, will have the effect of destroying the insect.

(To be Continued.)

**POTATO ROT.**—The Perth *Constitutional* says:—“We understand that the potato rot is making its appearance very extensively in this section of the country—scarcely a field escaping its ravages, and many being almost utterly destroyed. Quite a number of farmers are digging up their potatoes and selling them. It is supposed that one-half or two-thirds of the entire crop will be destroyed.”

## NOTICE.

THE FIRST EXHIBITION OF THE NORTH RIDING OF LEEDS AND GRENVILLE COUNTY AGRICULTURAL SOCIETY will be holden at FRANKVILLE, Township of Kitley, on the FIRST WEDNESDAY OF OCTOBER next.

FRANKVILLE, }  
Aug. 12th, 1858. }

GIDEON LEEHY,  
President.  
WM. SMITH,  
Secretary & Treasurer.