Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- [ ] Coloured covers/ Couverture de couleur
- [ ] Covers damaged/ Couverture endommagée
- [ ] Covers restored and/or laminated/ Couverture restaurée et/ou pelliculée
- [ ] Cover title missing/ Le titre de couverture manque
- [ ] Coloured maps/ Cartes géographiques en couleur
- [ ] Coloured ink (i.e. other than blue or black)/ Encre de couleur (i.e. autre que bleue ou noire)
- [ ] Coloured plates and/or illustrations/ Planches et/ou illustrations en couleur
- [x] Bound with other material/ Relié avec d'autres documents
- [x] Tight binding may cause shadows or distortion along interior margin/ La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure
- [ ] Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/ Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.

- [ ] Coloured pages/ Pages de couleur
- [x] Pages damaged/ Pages endommagées
- [ ] Pages restored and/or laminated/ Pages restaurées et/ou pelliculées
- [x] Pages discoloured, stained or foxed/ Pages décolorées, tachetées ou piquées
- [ ] Pages detached/ Pages détachées
- [x] Showthrough/ Transparence
- [x] Quality of print varies/ Qualité inégale de l'impression
- [x] Continuous pagination/ Pagination continue
- [ ] Includes index(es)/ Comprend un (des) index

  Title on header taken from:/ Le titre de l'en-tête provient:

- [ ] Title page of issue/ Page de titre de la livraison
- [ ] Caption of issue/ Titre de départ de la livraison
- [ ] Masthead/ Générique (périodiques) de la livraison

- [ ] Additional comments:/ Commentaires supplémentaires:

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	12X	14X	16X	18X	20X	22X	24X	26X	28X	30X	32X
									✓		

NEWCASTLE FARMER.

VOL. II.—NO. VI. COBOURG, FEBRUARY 1, 1848. THOS. PAGE,—Editor.

AGRICULTURAL MEETING AT DRAYTON MANOR.

(Concluded from the last "Farmer".)

Dr. PLAYFAIR remarked that so much had already been said about produce that he wished more particularly to draw attention to the fact that a great variation existed in the nature and qualities of that produce when obtained. There were two purposes to be accomplished by all food, one of them being the increase and repair of the bodies of our animals—the other the support of animal heat. The body was an engine destined to perform particular work, and required various materials to keep it in constant action.—Coal, which did admirably to generate steam, would be a most inadequate substance to repair the pistons and cranks of the steam-engine when it became damaged by use. So was it in the animal body, for that which built up its fabric was not suited to sustain its warmth, without which the exercise of its functions must cease. Food contained these substances in different proportions, some varieties of produce being well suited for fuel, while others were for true nutrition. Thus the Potato formed a cheap and excellent fuel for the body, but was most expensive and inefficient as a means of repairing its damaged parts, whilst beans answered well the latter purpose, and were comparatively valueless for the former. The manner of manuring crops depended upon which of the two classes they belonged to; the flesh-forming principles were always associated with phosphorus and sulphur, which must be supplied with bone-earth, and sulphates, while the warmth-giving foods principally depend for their growth on a free supply of alkalies. Besides this, as farmers are the cultivators of food for the nation, it was important for them to know, especially in times of scarcity, such as we have had, with what crops they could grow the largest amount of food on the same space. In this respect the produce is most variable. Thus, whilst Turnips, Mangold Wurzel, &c., will grow nearly 700 lbs. of flesh forming principles per acre, Beans 600, and Italian Rye-grass considerably more, you cannot obtain, in ordinary crops, more than 350 lbs. of potatoes and peas and barley, not more than 200 lbs. from a fair crop of Wheat or hay, or 150 lbs. from an average crop of Oats. The variation of produce is, therefore, very considerable. But as profit is naturally and most properly the great object of the farmer, it was equally important to know at what remunerative cost the public became supplied with the equivalent amount of various kinds of food. At London prices a man can buy a pound of flesh on the body, with milk at 3s.; with Turnips at 2s. 9d.; with Potatoes, Carrots, and butcher's meat, free from bone and fat, at 2s.; with oatmeal at 1s. 10d.; with bread, flour, and barley meal at 1s. 2d.; and with beans and peas at less than 6d. These considerations are far from trivial, because when we consider that an equal amount of nutritious matter can be obtained from one food at less than one-fourth the cost of another, this is only saying that in times of distress, with an intelligent application of money, we can feed four people, where formerly we only could feed one. True it is, that in this country the art of cookery is far behind that of our Continental neighbours, and that we have not acquired the important art of rendering cheap varieties of food palatable. Count Rumford, when administering the affairs of Bavaria, and in introducing his important ameliorations into the habits of the poor, used to say that the internal resources of a country for food were as much dependent upon its cooks as upon its farmers, and in this he was perhaps not very far wrong. He meant by so saying to imply that a skilful adjustment of food and its skilful treatment might so render the cheapest food palatable that you could adequately sustain a larger population upon a limited area by attention to the produce cultivated. It is only lately that philosophers have attended to the art of cookery, and most important results have already been obtained. It is now known that the flavouring principles are dissolved in the juices, so much so indeed, that if you macerate the flesh of a fox in the expressed juice of venison, and afterwards cook it, the former cannot be distinguished in flavour from the latter, or the flesh of a fowl may be made to taste like that of a pike by such maceration. In our ordinary way of cooking, however, a large portion of the flavouring substance is dissolved in the water, and is thrown away, unless it be, as is most proper, converted into soups. But far greater results follow from our ignorance of cooking. There is a substance called phosphate of soda contained in food, and it is by this salt that respiration is supported; without it we should die by asphyxia, as no means exist except this for carrying off carbonic acid from the system. This salt being soluble is very generally carried off from food during cooking, and the most distressing physiological results follow from the neglect. In salting meat, such phosphates are abundantly carried off with the brine, and scurvy naturally follows from the consequent want of adjustment between the organic and mineral portions of the food. Liebig, and others, have opened the way to study these important considerations in cookery, and he (Dr. Playfair) hoped to have an opportunity at some future time of explaining this subject more in detail to farmers. He now directed their attention to it, with the especial object of improving their cottage cookery, and the comfort of the workmen under their charge. If we could improve the cottage cookery of this country, if we could render palatable a greater variety of viands, the most important ends would be obtained. Wants would be created, and labour given for their gratification. A greater variety of produce would be cultivated in this country, labour would be better distributed and equalised, and the country would be freed from those dreaded visitations of famine which now unhappily arise from the failure of one of our few kinds of food.

Mr. PARKES said that he could mention a fact or two connected with the use of salt, which might be interesting to the farmers present, and, although not a farmer himself, he had, perhaps, more opportunities, from his extensive operations in drainage, of observing and learning the practice of farmers than the generality of agriculturists. It had been the habit for many years of those well known and excellent farmers, the Messrs. Outhwaite, of Burnessee, near Catterick, in Yorkshire, to apply a very large quantity of salt as a dressing to the soil in preparing for wheat, *he believed more than a ton per acre*, but he did not recollect the exact weight or measure. They found it expedient on their soil to work the land well during the autumn and winter, and sow Spring wheat. They were of opinion that the salt tended directly to the destruction of grubs, &c., and indirectly to the improvement of the plant itself. The land was well drained. The account of Messrs. Outhwaite's mode of farming was to be found in the reports of the Yorkshire Agricultural Society, which body had not unfrequently conferred on these gentlemen their prize for the best farmed land within their district. An instance of the presence of enormous quantities of salt in land not accompanied by infertility, might perhaps tend to disabuse the farmer's mind of a prevailing idea that salt was injurious, when

applied even moderately and with judgment. He had observed in the autumn of 1845 a wheat crop on some land warped from the Humber, at Patrington, in Yorkshire, the soil of which was quite white on the surface with crystallised salt, the result of powerful evaporation. The crop might average perhaps from 20 to 24 bushels per acre. This was the first crop of wheat taken off the reclaimed land after Rape allowed to seed, which is used in these salt crop districts as the precursor of wheat, and is considered to take more salt out of the soil, and to fit it more quickly for wheat than any other plant. These crops of Rape are frequently prodigious; salt, therefore, in such excess as actually to lie crystallised on the surface, is not injurious to Rape, and may possibly be very advantageously applied as a band tillage for Rape in soils which do not contain it. On first draining these warp lands from 4 to 5 feet deep, the water, after rain, issues so strong of salt as nearly to float an egg, and for years afterwards the water of drainage tastes brackish. That crops of all kinds—of wheat particularly—are vastly increased by draining, he had occasion to know from the effects produced on Mr. W. Marshall's estate at Enholmes, Patrington; but on the undrained lands, and therefore on soils not deprived of their salt by drainage, 5 quarters of wheat per acre, without the application of any manure, were a very common produce on this remarkable soil. The common earth-worm established itself in great numbers after drainage, but he had never observed any grubs or wireworm in those soils.

Sir Robt. Peel having proposed the health of the Dean of Westminster—

Dr. Buckland, in returning thanks, addressed the company to the following effect:—At this late hour I will trespass upon your time—which has been so long and so profitably occupied in hearing the results of the application of scientific principles to practical agriculture,—no further than to express my conviction of the soundness of the principles which have been set forth by the three practical agriculturists who have laid before us the results of their scientific management of lands, which under ordinary treatment were sterile, but in their hands have been rapidly rendered prolific in an unusual degree. It would be waste of time to enter into proofs of what is now universally acknowledged, and has been exemplified by the great improvements immediately resulting from drainage in the farms cultivated by Mr. Woodward, Mr. Mechi, and Mr. Huxtable, viz. that drainage is the foundation and first condition indispensable to the profitable cultivation of all lands that are naturally wet: for on such lands, without drainage, all applications of manure or attempts at improvement of any kind are vain. But the land once drained, is in fit condition to become the subject of any and all the profitable experiments we have with so much pleasure and profit heard described by the individuals who have made them. The best test of the truth of theories founded on the inductions of science, is an appeal to practical results, such as have been detailed to us; it has been my good fortune to inspect on two occasions the farm and farm-yard management of Mr. Huxtable, and thereby to be able to bear testimony to the reality of the results he has enumerated in no exaggerated terms. The great point he has established in practice, and which all the experiments of scientific men have indicated to be the basis of practical agriculture, is this, that as it is the object of the cultivator to obtain from the earth those vegetable and animal productions which contain the elements of the food of man, so it is the object of the scientific farmer to apply to the earth, in the form of manure, the elements of the food of plants, in such kind and in such proportions as chemical analysis shows each kind of plant and each kind of grain respectively to require; and I believe that no living man has carried the combination of science with practice, as to these points, farther, or with more perfect success, than Mr. Huxtable. Dr. Lyon Playfair has stated valuable results of chemical analysis, indicating the proportions of various kinds of nourishment in the seeds of plants we use for food; and has told us that scientific cookery has become the most recent addition to the subjects of the laboratory; and that whilst the farmer ought rather to study to supply flesh to the cook, than tallow to the chandler, the cook must also learn from the chemist the most efficient and most economical prescriptions for the preparation of that best result of agricultural experiments, viz., nutritious and wholesome and savoury food for man. I am happy that many of the experiments that have been quoted by Mr. Mechi and Mr. Huxtable have been lately printed in fuller detail, in two cheap pamphlets, of inestimable value to all practical farmers; and I earnestly commend them to their perusal. I would also commend Liebig's last book, entitled "Researches on the Chemistry of Food," 1847.

The health of Sir Robert Peel having been proposed by Lord Talbot, drank with enthusiasm, and acknowledged in a brief but admirable speech, expressive of the strong interest taken by the Right Hon. Baronet in advancing the agriculture of his country and promoting the welfare of the farmer, notwithstanding what had been said to the contrary, the meeting separated, leaving a conviction on the minds of those who were present that it was one of the most interesting and important that has ever been held in England.

LIME AS MANURE.

Lime appears to have succeeded much better as manure in some regions of the country than in others. The eminent success which has attended its use in many places, should induce a trial, at least throughout the country.

Two communications have appeared in the *Ohio Cultivator*, describing its very successful application, of which the following is the substance:—The first experiment was eight or nine years ago, with three acres of old, worn-out field, the soil clayey, with some loose sandstones. It was applied at the rate of 100 bushels per acre, after the land was ploughed, and before it was harrowed, for corn. The corn on the limed ground was nearly twice as heavy as on the rest. The same was true of the oats that followed the corn; and of the wheat after the oats; and of the clover after the wheat, where the heavy growth indicated to a foot where the lime terminated. A subsequent communication from the same writer states, that lime had been applied both with and without manure. "When we put on the lime, we always put on all the manure we make, either in the spring or in the fall—which is from 75 to 100 cart-loads. Lime itself will make the ground produce about 50 per cent.—lime and manure, 100 per cent.—when we put on 100 bushels of lime per acre, which we always aim to do."

Sorrel.—The same correspondent states that a sandy field, or a hill of chestnut, poplar, and hickory timber, soon after it was cleared, failed to produce much grass, or anything else than horse sorrel. A hundred bushels of lime per acre were applied before sowing wheat, and clover sowed on the wheat towards spring.—"The sorrel left about the time it saw the young clover, & has not been seen since."

Farmers who have applied lime with partial or little apparent benefit, often estimate its use erroneously, by not taking into account the long endurance of its enriching powers, which is many times that of common barn manure.—*Albany Cultivator.*

From the Albany Cultivator.

MAKING AND SAVING MANURE.

Messrs. Editors—In looking over the back volumes of the *Cultivator*, my attention was caught by the remarks of two distinguished individuals, appended below, and upon which you then made some valuable observations. As the subject is one of vital importance to the farmer, and one upon which there should be "line upon line," I shall make a few observations, the result of my own individual experience.

Arthur Young said many years ago, "he who is within scent of a dung-hill, smells that which his crop would have eaten if he would have permitted it."

Sir Humphry Davy demonstrated this. He says, "I placed a quantity of fermenting manure in a retort, and ascertained that it gave off a liquid containing a large proportion of salts of ammonia. Seeing this result, I introduced the beak of another retort, filled with similar manure, under the roots of some grass in the garden, and in less than a fortnight a very

distinct effect was produced on the grass upon the spot exposed to the influence of the matter disengaged in fermentation; it grew with much more luxuriance than the grass in any other part of the garden."

There are many substances on every farm, which, while in themselves enriching, may be profitably mixed with the manure, to absorb and retain those volatile portions which arise from the process of fermentation.

The first material I shall name, is swamp muck. It may be truly said, that the farmer who owns a muck hole of good quality, and knows how to use it, is possessed of a mine of wealth which will surely render his farm productive and profitable. I speak advisedly upon this subject, having used the article for several years in every variety of form. I say, without fear of argument or contradiction, that a compost, properly made, of two loads of muck to one of good, fresh manure, is equal, in its effects on gravelly or sandy soils, load for load, to green manure.

In order to manage muck to the best advantage, the farmer should so contrive matters as to get a year ahead with his manure, so as not to be obliged to use it until his compost is fully ripened. In my opinion, formed from repeated trials, the noxious acids must be fully expelled from the muck by age and fermentation, to reap full benefit from its application to the soil.

August and September are generally the most favourable months for digging muck. First, then, the swamps should be *thoroughly drained*—there should be no half way work here, for the benefit to be derived from it will fully warrant the undertaking, even if considerable expense is necessary. When drained, commence carting the muck to a suitable and dry spot on the field where it is to be used. Lay the cart loads of it in two rows, as long as the heap is to be when finished, with a space say of six or eight feet between. First spread down of the muck on each side, into the space between, a layer, ten or twelve inches thick, and then haul on the manure from the windows, driving *up to the ends* of this bed, and throwing in from the cart on to it a layer, say eight inches thick, of manure —the workmen should not drive on to the bed and tip up the cart to save labour, for reasons presently to be given—another layer of muck, shovelled on from each side, and then manure, using two loads of muck to one of manure, and so on until the heap reaches about five feet in height, the last covering being of muck. Care should be taken to lay the compost up as lightly as possible, in order to secure perfect fermentation. The team should not be driven up on to it, as we have seen farmers do, nor should even the workmen tread on it. For the same reason the heap should not be built too high, as the pressure upon the bottom courses will be so great as to prevent their rotting down thoroughly.

The compost gets into a general heat sooner or later, after it is made up, according to the weather or season of the year. It is proper here to remark that the summer months are most favourable for making up the heaps, although they may be made up as late as November. In this case, however, a greater proportion of manure must be used, and the heaps will need to be shovelled over the next April to fit them for spring crops. I have also composted muck both with lime and ashes, when the quantity of dressing for my land was not sufficient from my muck and manure compost. Last season I made a compost of sixty one-half cords of muck, and six casks of lime, seven bushels to the cask, and applied it to a field of ten acres of corn, using the manure compost as far as it would go, and then the lime and muck. The corn compared favourably, on the part of the field dressed with the lime and muck, to that where manure and muck was used; the whole field averaging a little better than sixty bushels per acre. I have also found that five or six bushels of ashes to a half cord of muck, makes a compost equal to either of the others. A load of leached ashes to six loads of muck, is also a good compost for sandy land.

In applying these composts to the soil, I have found, after trying it by spreading on to the grass ground, before breaking up and turning it under the whole depth of the furrow, and also by spreading on top of the furrow, and harrowing it in, that neither way was best. It is difficult to bury thirty or forty loads per acre sufficiently with the harrow, and turning it down to the bottom is too deep. I therefore do my breaking up late in the Fall, —say in November. The frosts of winter completely pulverise the surface, and kill the grass roots, so that in the spring I have a clean bed to work upon. The compost is then spread, thirty to forty loads per acre, and harrowed first, and then covered three to four inches with the plough. This I can easily do, as I always break up my grass land from six to nine inches deep, varying with the quality of the land. By this mode of practice, my corn crops always average as high as sixty bushels per acre, and on my best land sometimes as high as eighty bushels.

Having now given my experience with composts, I have something to say of the barn-yard. And by the way, Messrs. Editors, how many yards you will see upon a side hill, with perhaps a brook running by or near the lower side, where all the cream of the yard runs to, benefitting nobody knows who. Instead of this kind of management, the yard should be made considerably dishing towards the centre, and the sides will then be dry to walk around. A good supply of muck should be hauled to the yard in August or September, where, if the yard *is shaped right*, it will absorb all the liquids and wash of the higher parts, and retain them until wasted. The yard should be cleaned out after haying the next season, and the contents laid up in square compact heaps on the field where wanted. The loads should not be tipped up, to save work, sprawling five or six loads over a quarter of an acre, exposing a needless surface to evaporation, but nicely laid up; the straw and stalk litter and the liquids of the yard among the muck, will ferment it strongly, and the next spring it will be a black, free mass, and spread like garden mould.

In addition to supplying the yard liberally with muck, a quantity of leaves may be gathered, late in the fall, and used for bedding the cattle. Some farmers, instead of this, lay the planks of the cattle stalls with an opening between them of about one-half inch, and so arranged as to be easily taken up. Two feet thick of muck or loam, is put under the floor, and in the spring it is excellent manure.

The hog-pen is also an important help in making manure. Four or five hogs will make from April to December at least thirty loads of most excellent compost, if properly attended to. In fact it is a business which they seem fully to understand and appreciate. The hog yard should not be extended over too much ground, as there will be a loss by evaporation attending it. The yard should be in as small a compass as practicable, and two or three loads of materials put in at a time. As often as once a fortnight, holes should be made in the manure with an iron bar, and corn dropped into them. By attending to this operation, the hogs will work the compost over from top to bottom.

Every farm has not muck upon it, but every farm has something in the shape of enriching materials which may be profitably carted to the yards. Rich turf, thickly matted with grass roots, and dug about two inches deep, is an excellent material with which to cover a yard. The accumulation of leaves and vegetable mould in the hollows and at the foot of hills in woodlands—the accumulations by the sides of stone walls and fences in the lots, are also good. Every observing and enterprising farmer will find something on his farm, with which he may profitably increase his stock of manure.

I think that observation will fully justify me in the remark, that the farmers of New England might generally double the quantity of their manure heaps, without detriment to the quality, by attending to the collecting of those substances to be found on every farm, which, while enriching in themselves, absorb and retain much of the liquids and gases of the manure, which would otherwise run to waste.

F. Holbrook.

Brattleboro, Aug. 17, 1847.

From the Albany Cultivator.

SUBSOIL PLOUGHING.

We have often expressed the belief that the practice of subsoil ploughing would be attended with great advantages

in many situations in this country. In England it is becoming more and more adopted, and we can see no reason why its use should not be attended with equal benefits here. The cut at the head of this article, illustrates the manner in which this operation is performed. A team drawing the subsoil plough, follows in the furrow made by a common plough. It is proper to observe, that for subsoil ploughing to produce the greatest benefits on wet, tenacious soils, they should be first under-drained.

The Journal of the Transactions of the Highland Agricultural Society of Scotland, for January, 1847, contains an account of some very valuable experiments in regard to subsoil ploughing, furnished by Mr. J. Wilson. It is stated that the farm on which these experiments were made, had been under cultivation for a long period; that it consists of various kinds of soil—from a gravelly earth to a tenacious clay. The usual depth of ploughing for many years had been from five to six inches, and a hard crust had been formed at that depth.

The field first experimented on, contained thirteen acres, most of the soil being heavy, inclining to clay, on a clay subsoil, and the rest light soil, on a gravelly subsoil. It was under-drained in 1843, with tile, at the distance of fifteen feet between the drains. Previous to draining it had been very wet, and the crops it bore were generally poor. It was subsoiled in the Fall of 1844, the plough going across the drains. A common two-horse plough was first used, taking a depth of six to seven inches, and a subsoil plough with two horses followed, taking an additional depth of seven to eight inches. Eleven acres were ploughed in this manner, and two acres were left, which were only ploughed to the ordinary depth of six and a half inches. The whole field was manured alike—the manure being from yard dung and guano—and it was sowed to yellow turnips in the fore part of June. No difference was discernible in the crop till about the first of August, when the subsoiled portion showed a decided superiority, which became more and more apparent till the crop was taken up the last of October. The subsoiled portion gave 26 tons 7 cwt. per acre, and the part not subsoiled, 20 tons 7 cwt. per acre—making a difference in favour of subsoiling of 6 tons 7 cwt., or a value of £3 18s. per acre.

The next experiment was upon a field which had been furrow-drained with tiles in the autumn of 1844; the soil rather inclined to sand on a subsoil of sandy clay. Two acres were subsoil ploughed to the depth of fifteen inches in December, 1845, and 2 acres were only ploughed to the depth of six or seven inches. Two ridges of the field were *trench-ploughed* to the depth of thirteen inches. [Trench ploughing is performed by running a plough of the common construction in the furrow of another of the same kind. Its operation and effects are different from those of the subsoil plough, as the surface soil is covered by the earth taken up from below by the second plough.] The field was manured alike with manure from the farm-yard, and planted to potatoes. The trench ploughed part gave 7 tons, 1 cwt., 2 quarters, per acre; the subsoiled, 7 tons, 9 cwt., 2 quarters; and the part only ploughed, 6 tons, 14 cwt., 1 quarter, per acre—making a difference of 15 cwt., 1 quarter per acre, in favour of subsoiling, over the part ploughed only in the ordinary way; and a difference of 8 cwt. over trench ploughing.

The next experiment was made on a field which had been partially drained several years since. The soil, "an earthy loam incumbent on clay." A portion of the field was subsoiled, and the remainder ploughed to the ordinary depth. The field was sown to barley in 1846. The appearance of the crop was most favourable on the subsoiled portion during the time it was growing, and when threshed, gave the following results:—The subsoiled portion yielded 8 quarters, 3 bushels, per acre, with 36½ cwt. of straw; the part not subsoiled, yielded 7 quarters, 4 bushels, 3 pecks, per acre, with 28 cwt. of straw—making a difference in favour of subsoiling of 6 bushels, 1 peck of grain, and 8½ cwt. of straw per acre.

From the Scottish Farmer.

GUANO.

DIRECTIONS FOR USE.—HINTS TO COTTAGERS.

In the application of this valuable manure, it is necessary to keep in view its powerful properties, and to exercise great care to prevent its coming into immediate contact with the newly-sown seed or the foliage of plants and flowers. It should never be placed in contact with seeds; for all seeds in the process of germination give off a greater or less quantity of carbonic acid and vinegar; and these acids, having strong affinities for the ammoniacal portion of the guano, are apt to attract it so powerfully, as to check and even destroy vegetation.

PREPARATION.—*To secure its safe application*, it has been found most effectual to mix it with about four times its own bulk of finely sifted mould, ashes, or charcoal, or even with sand, if the soil be of a cold clayey nature; and that the mixture may be complete, the guano should, *before mixing*, be carefully passed through a fine sieve. That portion of the guano, such as the undecomposed bones, beaks, or claws of birds, which cannot be passed through the sieve, will nevertheless be found strongly impregnated with ammoniacal salts, and by steeping in water, will readily yield a rich liquid manure. An intelligent farmer in Dumfriesshire, in reference to the necessity of mixing the guano before applying it to the soil, says, the objects of mixing guano, are, 1, To partly disinfect it by absorbing its volatile products and diminishing its smell. 2, To separate its active particles, and thereby diminish their action on each other. 3, To present it to warm soils in a form in which its action will be less violent at first, but more protracted and steady than when given in an unmixed state. Of course, the colder the soil, and the earlier the season when sown, the less quantity of mixture is needed, and conversely. But, as a general rule, it should be mixed as equally as possible, with four times its bulk of finely sifted, moderately dry, black or brown coloured earth, or peaty matter, sawdust, slightly burnt clay, charred turf, coal or peat ashes, whichever of these substances can be most conveniently had. Perhaps newly-burnt charcoal used as soon as cold, is the best matter that can be had for mixing; but as it can seldom be at the Farmer's command, any of the above matters will answer in its stead. Where a considerable quantity of useless wood can be had, it might be piled up, surrounded, and nearly covered with clayey or spatty turf, and burnt with little admission of air. When cold, the charcoal, clay, and charred turfy matter, if well broken with a spade, mixed, and put through a sieve, will make an excellent mixture for guano, especially for light warm soils. Some have mixed guano with sand, and when for a cold clayey soil, this mixture seems very suitable; only sand need not be given in more than double its bulk, and should be put in the soil soon after mixing, whereas any of the other mixtures may, with advantage, stand, beat up, under cover for a week or more, according to the weather, character of the soil, and distance at which it is to be put below the seed, and also in proportion to the quantity of guano given to the acre. The colder and heavier the soil, and the colder the weather, the more slightly the manure ought to be covered, and conversely. No rules can supersede experience in this. When either dung or bones are given as part of the manure, and when the soil is moderately moist, or disposed to clay or peat, the *guano* should be put near the seed. Again, where the ground has just been limed, the guano ought both to be given in a large quantity of mixture, and covered rather deeper than in ground not limed for a year or more. On light soils, lime should, if possible, be mixed some weeks before guano is given.

It would appear that grass crops, of all others, most appreciate the *guano manure*, and shew the most wholesome and productive results, under applications varying from 3 cwt. to 20 cwt. per imperial acre; and considering that by far the larger portion of the soil of Great Britain consists of pasture and meadow-land, it is of paramount importance that the grazier should be enabled to set a proper value on this unexceptionable manure. The increase of weight and bulk thus obtained does not arise from the greater abundance of coarse rank grass, as some persons have insinuated, but from the general luxuriance of the crop, and parti-

cularly from the increased thickness of the growth of the short and finer grass: this latter effect will be very observable after cutting.

As some anxiety at one time existed as to the quality of hay or grass raised by *guano*, it is proper to state, that the hay has proved of the finest quality; and moreover, that on pasture land, where an experiment field was partly manured with guano and partly left in its original state, the cattle were observed to give a decided preference to the guanoed portion of the field. Where a liberal application of guano is intended, it is particularly recommended to divide the manure into at least two successive sowings, as the full quantity, given at one application, might injure the more tender grass. The following extract from the "Mark Lane Express," exhibits the productive effects of 3 cwt. of *guano* per acre, and at the same time, notices the peculiar value of this manure to the cottager, by increasing his limited resources, a suggestion which, it is hoped, will be appreciated by those who take a benevolent interest in that humble class:—"On an eight-acre field, sown with 3 cwt. of guano, and 3 bushels of Italian rye-grass per acre, on the 29th of April, cut on the 3rd of August, the produce weighed, when cut, 18 tons, and when dry and ready for stack, 4 tons per acre. Much of this crop was upwards of 5 feet long; so rapid was the growth, that fifty hours after cutting, it had again sprung up to the height of 3½ inches. With such grass, and such manure so easily convertible into liquid, I see no reason to doubt that the cottager, with his five roods of land, could supply his house with vegetable, and cow with winter and summer food, thereby providing for his family an almost entire subsistence.

From the Farmers' Gazette.

REMEDY FOR SMUT IN WHEAT.

Sir—I see by your paper inquiries concerning the smut in wheat: there is a very simple but most effectual remedy, which I have practiced these 32 years, and never failed. I do not pretend to originality; but I will tell you all about it, and the result of my experiments. I found it in a publication of husbandry in Flanders. I was at a serious loss, on account of smut, when I came here; indeed my wheat was not saleable until I met with the following recipe:—60 lbs. of quick-lime and 30 lbs. of salt, made into a solution with water sufficient to cover 5 cwt., and allowed so to remain for 48 hours.

To test this, I procured the worst smutted wheat I could find in this country, which amply satisfied me, for it took four successive waters to clear it. I sowed 8 stones, divided into four parts, on equal ridges (we in this country generally sow 20 stones to the Irish acre,) which I watched and noted as follows:—

No. 1. Merely steeped so as to cleanse it of blackened and bad wheat.

No. 2. Steeped in the solution 12 hours.

No. 3. Steeped 24 hours.

No. 4. Steeped 48 hours.

At reaping time, No. 1 was, as you may suppose, dreadfully black; No. 2. a good deal of black in it; No. 3, none at all; No. 4, none at all.

Nos. 3 and 4 swelled as large as barley, but did not burst. No. 2 swelled also, but not quite so much. Seeing No. 3 succeeded, as well as No. 4, I have practiced it ever since, and I declare to you I have not known what smut was, except one unpropitious wet season when there were a few ears that showed black but not in balls, open like oats, which the rain washed off. The people came far and near for the remedy, and I never heard it had failed when they could be induced to brave the ridicule of some, and their own fears, as they saw the wheat swelled and took up the solution. The great remedy is the steeping 24 hours. I steep it at 6 in the evening, and let it lie in a heap to drain, and sow it next day. I have kept it in 10 days, when the weather broke, turning it every day, and without harm. There is also another good, the handfull is so much larger that they cannot well sow it so thick, which is a great evil in this country. My land is light tilly subsoil—no gravel—but when properly treated brings very hearty crops.—Yours, &c.,

A Subscriber.

From the Farmers' Gazette.

THE CAUSE AND CURE OF GREASE IN HORSES.

"Can you tell me the cause and cure of grease in the hocks of horses?—A Postmaster."—The cause is generally neglect and improper treatment. In the stables of our cavalry no such disease is known. Where the heels of a horse, in coming off a journey, are left covered with mire and wet, and not rubbed dry as they ought to be, the skin of the horse's heel becomes inflamed, the secretion of oily matter, which keeps the skin pliable under the long continued motion of the fetlock, is stopped, and the skin swells, cracks, and sometimes becomes fungous. The cure may be gathered from the following passage from Mr. Youatt's work on The Horse:—"A great deal of error has prevailed, and it has led to much bad practice, in connecting grease with the notion of humours flying about the horse, which must have vent somewhere, and which attack the heels as the weaker parts of the frame. Thence arise the physicking, and the long course of diuretics, which *truly* weaken the animal, and often do irreparable mischief. Grease is a local complaint; it is produced principally by causes which act locally; and it is most successfully treated by local applications. Physic and diuretics may be useful in abating inflammation; but the grand object is to abate inflammatory action which exists in the skin of the heel, and to heal the wounds, and remedy the mischief which it has occasioned.—The first appearance of grease is usually a dry and scruffy state of the skin of the heel, with redness, heat, and itchness.—The heel should be well washed with soap and water; as much of the scruf should be detached as is easy removable: white ointment composed of one drachm of sugar of lead, rubbed down with an ounce of lard, will usually supple and cool, and heal the part. When cracks appear, the mode of treatment will depend on their extent and depth. If they are but slight, a lotion composed of a solution of two drachms of blue vitriol or four drachms of a pint of water, will often speedily dry them up and close them. But if the cracks are deep, with an ichorous discharge, and the lameness considerable, it will be necessary to poultice the heel. A poultice of linseed meal will be most effectual, unless the discharge is thin and offensive, when an ounce of finely powdered charcoal should be mixed with the linseed meal, or a poultice may be made of carrots, boiled soft, and mashed. The efficacy of a carrot poultice is sufficiently appreciated in cases like these. When the inflammation and pain have evidently subsided, and the cracks discharge good matter, they may be dressed with an ointment composed of one part of rosin and three of lard, melted together, and one part of calamine powder added, when these begin to get cool. The healing will be quickened if the cracks are occasionally washed with either the vitrol, or alum solution. A mild diuretic may here be given every third day, but a mild dose of physic will form the best medicine that can be administered."

THE FOOD QUESTION.—WHAT IS THE AVERAGE YIELD OF AN ACRE OF POTATOES?

To the Editor of Bell's Weekly Messenger.

Sir,—As I have always questioned the accuracy of the quantity of the estimates of the potato failure as applied to Ireland, and consider my views (as given in February) have been fully supported by the comparatively small amount of foreign grain, which the returns show has been required to meet it, I feel called on to reply to Mr. J. W. Rogers' letter in a late number of the *Agricultural Gazette*. Mr. Rogers has given a number of authorities to show that the average yield of an acre of land, planted with potatoes, is 9 tons; and has quoted tables to prove that the nutriment per acre from potatoes is four times greater than from wheat. He also thinks the deficiency of food this year in Ireland, from short planting, is equivalent to 3,600,000 tons of wheat (that is, to 17,000,000 qrs). I think I shall be able to show that these statements are very incorrect, and, as they may mislead, I would prevent the mischief they are calculated to effect. When the prices of potatoes were higher than they have been of late years, I was concerned in the growth of several hundreds acres of this root for several years, but the cultivation was not profitable, and I

abandoned them as a farming crop, except in odd pieces, and for my own consumption; and on referring back to my books, I find I rarely obtained over five tons to the acre of marketable roots. It is possible Mr. Rogers may think I was a less successful grower than others, but this will be seen hardly to have been the case, for their growth by farmers for sale has been often attempted on a large scale, but has usually been abandoned, except in the immediate vicinity of large towns, where abundance of manure at a trifling cost may be had; and yet the cultivation is much more simple than for grain. Land will grow potatoes with less preparation, and when in a very unsuitable state for corn; and they admit late spring planting. They, too, occupy the ground only half the time of wheat, and admit of having two crops in the year. I have known the same piece of land produce a crop in June and another in October, and it is a common practice to precede them by green rye or tares. If an average of 9 tons per acre were obtainable, where is there a farmer who would not have found potatoes a far more profitable crop than wheat?

9 tons, at 70s. per ton (the lowest market price,) would be . .	£31 10
Contrast this with the recognised yield of wheat per acre: 3½ qrs. at 60s. per acre	£10 10
2 loads of straw, at 30s. per load,	3 0
	£13 10

and a difference of more than a hundred per cent., after deducting the cost of seed (the principal expense in growing potatoes) remains in their favour. The error in supposing so large a return to be an average growth has, I think, arisen from calculations based on information taken from gardeners or growers on a small scale, and with very high cultivation, and also from weighing crops when fresh taken out of ground: in both these ways would gross miscalculations arise. The skill, extra pains, and attention that gardeners give in their cultivation, return them double the yield that farmers obtain, and by the same means might wheat be made to return 7 or 8 quarters to the acre in place of 3 or 4. If a comparison between what an acre of wheat and an acre of potatoes returns has to be drawn, it should be made upon the yield afforded under similar care and expenditure.—Another source of error has probably been in not allowing for the large loss of weight the potato sustains by keeping; when fresh out of ground three-fourths of its weight is water, but before it reaches the chemist's hand it will have lost a large proportion of its moisture, and therefore his analysis in their relative proportions will be a very erroneous data whereby to calculate the nutriment of an acre upon the gross weight. I believe no better test of the relative cost and nutriment of wheat and potatoes can be brought forward than a comparison between their retail prices and their relative usefulness:—

Wheat at 60s. per qr. is 1½d. per lb.
Potatoes at 93s. 4d. per ton is 0½d. "

What I have said of my experience and of that of farmers generally as to the profit of growing potatoes, proves that by farming cultivation the above prices bear a relative proportion to the cost at which they may be raised, and if this is so there remains only to consider practically whether or not a pound of wheat be not in nutriment equivalent to 3 lbs. of raw potatoes for human support? and if so we must look to some other occasion for the general use of potatoes in Ireland than to their cheaper production, or their larger produce of food. I think we may at once trace their general growth rather to their simpler cultivation and adaptation for food, and above all to the ready means they afford the Irish peasantry to turn to account their little allotments of ground and their otherwise unoccupied labour. With reference to the estimate which would make the deficient growth of potatoes this year to be 14,400,000 tons—a quantity said in the same estimate to be equivalent in wheat to 3 600,000 tons (that is to say 17,000,000 qrs.), I fancy I need say little. Why, the whole agricultural produce of Ireland, corn, cattle, and potatoes, is not supposed on an average of years to reach the value of £36,000 000, and the population is only 8,000,000. The entire quantity of foreign grain imported into Great Britain in the year ending Sept'r 5th, 1847, and which had to supply the void of potatoes, oats, barley, beans, and peas, did not amount to an equivalent to two thirds of what is here talked of as a deficiency in the growth of potatoes in Ireland. The importations of wheat amounted to only 4½ million quarters, and of wheat and all other grain together to only 10,195,921 quarters. This fact is at once answer to Mr. Rogers' estimate, and a conclusive proof of the very erroneous calculations upon which Irish members last year pleaded for Ireland, and upon which the too liberal grant of £8,000,000 was awarded—a grant far greater than the value of the entire loss at market prices. I allude to those calculations which last winter made the loss of potatoes in Ireland to be equivalent to 15 million tons (the most moderate—many reached 30 millions). In ordinary years the importations of foreign grain into Britain reaches four million qrs., so that of last year's importations six million qrs., and six millions only, supplied the vacuum that the loss of potatoes, the deficient growth of oats and barley, the failure of beans and peas, a deficient supply of winter greens, and a long unusually severe winter occasioned to all Britain.

I am,
Sir, &c.,
HEWITT DAVIS.

3, Frederick's-place,
Old Jewry, London.

From Bell's Weekly Messenger.

AGRICULTURAL REPORT.

SUSSEX.

We do not recollect ever sitting down to write a report with feelings at all akin to those which now make us doubt whether we ought to trust ourselves to do so, but as your county reports will be expected in your next, we venture on the task. In former reports we have unhesitatingly said, that to confine our observations in momentous times like the present merely to giving an account of the crops of corn, would be as absurd as to debate on the colour of the paper whilst the house is in flames. First, then, as to the great point in the farmer's calendar, the crop of wheat. We believe that the crop of 1847 would have been sufficient to feed our population without a bushel of foreign wheat—and yet we have had for the last two months our markets overwhelmed with foreign supplies, and we are convinced that be the price however low next summer, we shall have foreign corn weekly coming into our markets, even though home grown corn be confessedly lower than the price for which it can be grown. But that which makes it even difficult for us to keep our temper, is the impudent assurance of those parties who have so strongly advocated free trade, and who now coolly say, "The fact is, that we are poor, and we must bear our poverty as well as we can." Surely this out-herods Herod. These worthies have had entirely their own way. They were always boasting of this being the richest country in the world; it only required free trade to make it still richer. Their views prevailed. Free trade is carried, and we are then coolly told that we are now poor. Let every one look back to the predictions of the two parties—the free traders and protectionists—and will any one dare to deny, that the promises of the benefit from free trade have turned out entirely deceptive? Let us review what was said by Sir Robert Peel on the introduction of his great free trade measure, the abolition of the corn laws. The main argument urged for the alteration was, that notwithstanding the remission of duties to a great amount on particular articles, the consumption of these articles had so much increased as to cause little or no loss to the revenue. Then what is the fact, as proved by the returns moved for by that able detector of Sir Robert Peel's fallacies, Lord George Bentinck? That instead of the revenue being the same, there was an absolute loss on those articles of more than five millions sterling!!! This is most ably shown in the last number of the *Quarterly Review*. What, then, was the cause of the increase of revenue from the articles which Sir Robert did not meddle with?—that is, the Excise. Nothing but the immense sums of money paid weekly in every part of the kingdom for labour on railroads; every labourer in full employment, and earning double wages, and

consuming twice as much of excisable commodities as he did before. Our manufacturers, also, participated in the prosperity, as they wore more clothes of every description; in fact, not a tradesman in any town near the making a railway but what received benefit thereby. This was the real secret of the revenue increasing on some articles; but, let it never be forgotten, on articles untouched by Sir Robert Peel's tariff. The late Premier must have known this. He had access to official documents which was denied to his opponents. It was therefore practising a most unfair delusion on the legislature merely to carry his views into execution. The truth is now revealed, and we will ask any honest man, Is Sir Robert Peel again to be trusted? We will now look at that which has convulsed the whole kingdom, the last two or three weeks—viz., the state of our monetary affairs. Can it be forgotten, that only as late as 1844, Sir Robt. Peel produced his measure as a panacea for all panics? Was he not then told by Lord Ashburton, and many of the first bankers in London, men of long experience, that it would fail on the first emergency? Has it not done so? Already have many houses of undoubted solvency succumbed to the storm, caused by this now fanciful theory; and had ministers not given way, there must have been a general convulsion from one end of the kingdom to the other. Will Sir Robert Peel again become the idol of the Stock Exchange? We trow not. On the contrary, we express our firm conviction that good sense will once more return to our legislature, and that our manufacturers will be the first to see that by advocating free trade, they have sacrificed the substance for the shadow. We will conclude by a short reference to another matter. This year the crop of barley is very great. The price must be low, and we shall not be surprised to see the duty on malt nearly as much per quarter as the price of the barley. Suppose Sir Robert Peel had taken off that oppressive tax, instead of taking off duties to the same amount, which he did, on foreign articles. What would have been the difference? The whole benefit would have been put into the pockets of our own population, whilst the benefits from the remission of the duties which were taken off have nearly all gone into the pockets of the foreigners. Let us still hope that before too late it may be found that real charity begins at home—that England herself is England's best friend; and that to buy in the cheapest market is not always true wisdom, but may, as it often does, eventually prove the dearest.

Query, What are Luxuries?—A candle would have been a luxury to King Alfred, a half-crown cotton gown to his Queen. Carpets would have been luxuries to Henry VII.; glass windows to his nobles; and silk stockings and gowns to Queen Elizabeth.

HOW PEOPLE LIVED BEFORE THE ERA OF POTATOES.

We think it a very great hardship this year to be obliged to make shift without potatoes, and yet, as we stated, it is not very long since the people of this country did so permanently, for the good reason that the root was little grown. We met with an amusing instance of the dislike and prejudice with which our fathers regarded this esculent on its introduction —quite equal to our regret at its threatened exit—in the following extract from a letter written in 1814, by the late Patrick Millar of Dalswinton, (the well-known steam boat experimentalist, and an improving landlord, greatly in advance of his age,) to Dr. Singer of Dumfries:—"A friend of mine, the late Peter Wilson, a minister in Ayrshire, told me, 50 years ago, of his having cultivated and raised more potatoes in his glebe than he had occasion for in his family, and that he advertised them by placard upon his own and other church doors, for sale at a low price. No one offered to purchase. He next Sunday reduced the price, but to no purpose. Unwilling to put what he could not use in the dunghill, he advertised they might be taken away without payment. He waited long, but nobody appeared to take them as a gift, so that he had to bury them in the dunghill." People actually thought them unwholesome, and the remains of this prejudice existed in some places at the time the statistical accounts were written (1796), when their cultivation was become pretty general. Dr. Singer mentions that people still in life remember to have seen a few potatoes put up in a box and sent to Edinburgh as a rare present from the county of Dumfries, and that their culture was confined to a few wet bogs, on the lazy-bed system. The whole crop, when raised, was clean washed and put up among "shelling sids," in a sack.—The common diet, says the Doctor, was oatmeal, barley, or bere, cleared of the husks in a stone trough or quern, by a wooden mallet, and winnowed in two sheep-skin "weehts." This coarsely-made barley was bolted with milk; while "greens," mashed with oatmeal, relieved the diet. After 1760 the cultivation of the potato gradually became more general, and the root came to be more liked, some parishes having proposed to erect a statue to Sir W. Raleigh, who first brought over the root from America. Indeed, it came to be as much bepraised as before it was slighted. It was said to be conducive to the health of tradesmen—to prevent scarcity—to be the most profitable of crops—the richest present of the New World, and a corrective to the effects of salt provisions, &c. &c. The honour of having been the first to practise field culture of potatoes is claimed by Robert Graham, Esq., of Tamraeur, parish of Kilsyth. His practice was to dibble and hand-hoe, the plants being 3 feet from each other in all directions; and in the year 1762, so successful was his management, that he raised 16½ bolls from one peck of seed, as duly attested in the newspapers of the day by three credible witnesses. One Thomas Prentice, in same parish, had introduced its useful culture in the kitchen garden in 1730.

In the year 1782, a season of dearth, occurred the first wide-spread destruction of the potato crop. The summer of 1782 was cold and stormy, so fatally retarding the progress of the crops, that in October oats and barley were still green. On 5th October, a frost of arctic severity set in, and in one night blasted the whole crops, both of oats and potatoes. The first bitten grain became white, and ceased to ripen. The markets were nearly unsupplied, and what was brought for sale was of the worst quality. In some parishes the oats were cut out from amidst the ice and snow of Dec'r, and in some Highland districts continued buried till February. Those who had sown 40 bolls, in many places did not obtain 20; while the oatmeal was dark in colour, and of an acid disagreeable flavour. It was more like mill dust than meal. The porridge made of it ran to water. Many were compelled to kill their cattle, and eat their flesh without bread. The poor along the sea-coast lived on shell-fish, &c. Numbers lived on nettles and snails. By the exertions of Sir John Sinclair, a Government grant to the Highland districts—the worst off—was obtained, and the copious stores of white peas for the use of the navy were exposed for sale. We were then on the heels of the American war; and that Egypt, from which we now draw such copious supplies, was shut out to our famishing countrymen. The Americans, indeed, exhausted by war, had nothing to spare. Our other trade was small and slow, so that the sufferings of the people were intense, and their prospects vastly worse, than ours can be. The cold and deficiency of nutriment induced fevers and pestilential diseases, and thus directly or indirectly many deaths were the result of this season of scarcity. The people for years after had, in many places, a dull and melancholy look, and the curling stone lay neglected till 1788. In comparing these with our present circumstances, the odds are greatly in our favour. We have had a good, early, and well-secured grain harvest, while such is the extent and elasticity of our trade and commerce in these times of peace, that in whatever foreign country there is a ship-load of provisions to be got at prices that will remunerate the importer, our enterprising merchants will be sure to find it out, and so increase our supplies. Indeed, with free unfettered trade, we have little to fear in the way of famine. Britain, as she is richer and can beat other nations in manufactures, can also beat them in the price she can give for the competed-for surplus food of favoured countries, and we have every chance, through the ordinary channels of trade, to have a better and larger supply of food than our neighbours.—*Ayr Advertiser.*

BLIGHTS OF THE WHEAT.*

CHAPTER I.

The preservation and purity of the flour of wheat will be universally acknowledged to be matters of the highest importance; but the methods by which these objects may be attained, are much more dependent on an accurate knowledge of certain extremely minute devastators of the growing crops, than has been hitherto generally conceived. Those persons whose province it is to cultivate and reap our wheat fields, have unfortunately not been properly informed as to the real nature of the little pests from which they have suffered. The consequence of this has been a large destruction of food, and a frequent deterioration of that which has been saved. In the year 1841, the absence of this essential knowledge amongst farmers was clearly demonstrated. A prize was offered by the Agricultural Society of England for the best essay on the blights affecting the corn fields, but tho' many were sent in, not one was deemed meritorious. By a similar want of physical science the inquiries of a large provincial association into the habits of the turnip fly were rendered totally useless, because they were not first directed to the natural history of the insect. Such investigations have been principally the task of botanists and entomologists, whose statements have failed to elicit the general attention they deserved. Unscientific persons have been repelled from the task of carefully perusing them, by their difficulty in understanding the technical terms necessarily employed by the authors. From such sources, however, they can alone derive the information that will lead to satisfactory results, and every agriculturist, who has the opportunity, ought to endeavour to make himself sufficiently master of the elementary knowledge needful to this end. It is by these means alone that he can hope to rise to real excellence in carrying on his interesting avocations, as well as to escape the ill effects of many, to him, inexplicable contingencies by which he finds himself constantly thwarted. Happily the British farmer has lately been awakened to the advantages afforded him in the laboratory of nature, by the guidance of true philosophy. The period, therefore, seems to have arrived when a popular treatise descriptive of the secrets which the microscope unfolds to the scientific observer, with regard to the hitherto mysterious destroyers of the wheat plant, will be both acceptable and useful to this valuable portion of our community, as well as to the public at large.

These little ravagers of our growing crops of corn are amongst the most wonderful of living organized things; and altho' they inflict unspeakable damage under certain circumstances, their existence, as we shall hereafter notice, embodies great and often beneficent designs. They also call forth the exercise of human ingenuity in the investigation of their habits, and the prevention of the mischiefs they occasion. These mischiefs are not unfrequently checked in most striking ways by the great Author of nature himself, and afford the strongest assurance to the reflecting mind that he ever mingles mercy with judgment. A multitude of mysterious evils encompasses all that is accorded to man in this imperfect state of his existence, but there is not one, material or spiritual, for which an effectual antagonism may not be found if sought for aright. Still it must be remembered that much of what is received as common truth on these points, is nothing more than common error. This is equally the case in religion, in philosophy, in morals, and in science. Every endeavour to correct and inform on sound principles, however humbly it may be made, is to be regarded as worthy of attention; and we may be assured that not a single creature has been formed by the hand of God, that is not deserving of the attention of a reasonable mind. For want of such inquiry we have suffered much, both in actual injury, as well as in the nonacquirement of that knowledge which tends to exalt the faculties of our understandings, and leads to adoration of the great supreme Cause, as much the object of our admiration in what seems only an organized atom, as in the more visible living works of greater dimensions. Whatever escapes the unassisted eye of man is often treated with indifference, but there is not a thing formed on which there is not stamped the seal of omnipotence and infinite wisdom—

> Shall little haughty ignorance pronounce
> His works unwise, of which the smallest part
> Exceeds the narrow vision of her mind?
> As if upon a full-proportioned dome,
> Of swelling columns reared, the pride of art,
> A critic fly, whose feeble ray scarce spreads,
> An inch around, with blind presumption bold
> Should dare to tax the structure of the whole.
>
> THOMSON.

The natural perfections of God are set before us for our admiration, the moral for our imitation. The book of nature answers our questions as regards the former; the book of revelation as to the latter. They harmonize with each other. In the subjects of this treatise we have a most prominent example of the importance of research, both as regards the avoidance of evil and the manifestation of creative wonders. The promised harvests of our fields droop beneath the corrosive influences of minute agencies, multiplied till they become at times almost overwhelming. Their forms, their sources, the principles on which they can by any possibility aid in the economy of the world seem alike, at first, undefinable. So do their remedies. Masses of dark unwholesome blights blast the growing plants in our corn fields, and infect our granaries. To the common observer they appear shapeless and disgusting; but the eye of science has penetrated their secret nature, and beholds, in their exquisite organism, incredible reproductive power, and, under circumstances of a peculiar kind, uses. Besides, we have discovered methods of checking their destructive extension. In the rural districts, ignorance has given them all sorts of grotesque designations without the remotest conception of their generic characters, properties, and antidotes. Even where the last have been hit upon by chance, few that use them know what they are contending with, or the reasons of the methods they apply. Nor have hundreds of tillers of the soil, when they grieve over the withered grains of wheat that spoil the sample and diminish the hoped-for return, the least notion of the habits of the little pests which have caused such deficiency. Still less do they suppose that there are men who can solve these mysteries, and lay the whole facts of such cases before them.

It is the design of the author to unfold some of these secrets which have hitherto been so seldom, if at all, described in popular language. Attention will be principally directed to these blights which are the work of *parasites*, both fungi and insects. It will be proper, therefore, first, to define what is meant by the term *parasite*. It is derived from the Greek word *(parositos,)* meaning one that lives at the expense of another. From this derivation, it will readily be seen that the term is appropriately taken by naturalists to signify that whatever they so name lives at the expense of some other thing. We should therefore define the parasite of a living organized substance, as another living organized substance produced in and owing its subsequent support to the former. The parasite of a vegetable is another vegetable existing under these circumstances. Parasites of plants are of two kinds, the leafy and the leafless.—Those that have leaves, of which the mistletoe is a familiar example, avail themselves of the ascending sap of the plants to which they are attached, elaborating it in their own leaves. But it is manifest that those which are leafless cannot do so; they require sap previously converted into proper juice, or descending sap in the plants to which they belong, having no organs of their own capable of effecting this essential process of vitality. Accordingly, they are found growing from the roots of their peculiar vegetables, which they rob of the *cambium*, or sap, that comes down after being elaborated in the leaves. We have a notable instance of such a parasite in the common *cuscuta*, or dodder, which attacks clover, and that sometimes to an alarming degree. Of late years complaints have been made that it has been found in great quantities on the plants of clover raised from foreign seed; and it would be well to pay attention to the thorough cleansing of it, after importation, from so dangerous an accompaniment. Another common parasite of this species, found also on clover, is the *orobanche*, or strangle-vetch. It is so called from the Greek words *(orobos,)* a vetch,

* From a small work published by the Religious Tract Society, entitled "Blights of the Wheat and their Remedies," by the Rev. Edwin Sidney.

and *(angkein,)* to strangle. It fastens first on the roots, but, unlike the dodder, afterwards sends out its fibres into the soil.

The parasites to which reference will first be made are principally minute fungi; and as it is impossible to comprehend their action upon the several parts of the wheat plants without some general knowledge of their nature and habits, it will be necessary to occupy a few pages with a description of them. Fungi belong, botanically speaking, to the class of *thallogens*, of which there are three alliances well described in Lindley's Vegetable Kingdom. These alliances are *algæ, fungi*, and *lichens*. The first live in water, or very moist places; the last two live in air. Between fungi and lichens, the chief distinction is that fungi are never accompanied by any of those curious green *gonidia*, or separated cellules of the medullary layer of the thallus, which, as well as their spores or seeds, form reproductive matter in lichens. Suppose, then, the question asked, What is a fungus? The answer is, it is a cellular, flowerless plant, deriving its nutriment by means of a *thallus*, to which the name has been given, *mycelium*, or *spawn*: it lives in air, and is propagated by *spores*, which are naked, or by *sporidia*, so called when inclosed in *asci*, or little vesicles. The way in which these spores germinate, generally speaking, is by a protrusion of the inner membrane, or an elongation of the outer, thus lengthening out its spawn.—This is the usual or *normal* mode: but, as will be hereafter seen, apparently not the only one, for we shall have to describe another method of germination in the case of certain parasitic fungi belonging to our subject. The term *sporule* will also occur, by which we mean the fine contents of the seeds, of the fungi. We shall see in the course of the work, that these fine contents appear to circulate in plants and grow. Fungi may be said to consist of a mass of little cells, or little threads, or of both combined in various ways. They have no fructification except their spores, or sporidia, of which the methods of attachment are singularly curious and beautiful. In their respiratory functions they approach to the peculiarity of animal rather than vegetable life, for they absorb oxygen and exhale carbonic acid gas—Like flesh, they contain a great quantity of nitrogen; and the substance called *fungine*, extracted from them by the chemist, is said to bear a dear resemblance to animal matter. They derive their nourishment from the substances on which they grow, and not, as in the case with the lichens and algæ, from the media in which they exist. The juices impregnated with the peculiar principles of the matter to which any particular fungus is attached, form its appropriate food.

Fungi assume various forms: the simplest is that of a series of articulated threads composed of little cellales placed end to end. We have an example of this form in common mould, as is easily to be seen by submitting it to the microscope. In some of these cases the joints separate, and appear to be capable of reproduction, but, in others, the spores are found on the last joints, and when the cellule which contains them bursts, they are dispersed, and, as soon as they find a suitable place germination commences. In the next condition we find fungi assuming a determinate figure, consisting of a mass of chiefly cellular tissue, the interior of which contains the spores adhering to it, and frequently four together. When this dries, the result is a dusty substance, which almost every one has witnessed who has gathered a common puff-ball. With regard to the most complete state, Mr. Berkeley observes, "they consist of two surfaces, one of which is even and imperforate, the other separated into plates or cells, and called the *hymenium*, to whose component cells, which form a structure resembling the pile of velvet, the spores are attached by means of little processes, and generally in fours, though occasionally the number is either less or greater." Observation of the parts of a mushroom, or any agaric fungus, will readily explain the meaning of this quotation, and convey a true notion of a fungus in its highest condition. As may be easily conceived of such a multitude of cells, some are barren, while the others are fertile.—Moreover, formations have been noticed further; and we have had attributed to them the performance of the offices of anthers.

Lindley and other eminent botanists, are of opinion that fungi might be broken up regularly into orders, founded on a knowledge of these peculiarities of structure.

1. When the *hymenium* (which is a diminutive of *humēn*, skin or membrane,) is naked, they might be called *hymenomycetes*; the term *mycetes* being derived from the Greek word *(mukēs,)* a fungus. Such are all the agaries, or mushroom-tribes. Their spores are set in fours, on little processes called *sporophores*, or spore-bearers.

2. When the *hymenium* is enclosed in a case, or *peridium*, the oppropriate name is *gastero mycetes*, from *(gastēr,)* a stomach. The spores of these are generally also in fours. This order would include puff-balls, and sphœrias.

3. The next order is proposed to be named *coniomycetes*, from *(conis.)* dust.—They have a dust-like appearance as, every one knows who has noticed the *uredines* of the cord-plants, to which abundant reference will be made in the course of this work. These have their spores single, or occasionally in sevens.

4. The fourth order would be designated *hymphomycetes*, from *(huphos.)* a web. Such are the fungi attacking vetches, potatoes, etc., called *botrytides*, from *(butrūs)* a bunch of grapes, the spores hanging naked like berries on the threads. They are also often in sevens in this order.

5. The fifth would be termed *ascomycetes*, from *(askos,)* a bag, the sporidia, or spore-cases, generally being contained in eights, in vesicles. Of this kind is the *erysiphe*, attacking peach-trees, hops, peas and beans.

6. The sixth and last should be called *physo-mycetes*, from *(pusha.)* a blown bladder, because the spores are surmounted by a sort of vesicular veil, called by botanists, a *sporangium*. The thallus of these fungi is floccose.

Such are the orders into which the fungi are capable of being divided; and when the hard names derived from the Greek language are mastered, they greatly assist in a correct knowledge of these curious plants, without which no accurate investigation into their habits can be effectually made.

The properties of fungi are as remarkable as their forms. Some of them are excellent for food, and are eaten in this country and throughout Europe. The mushroom, the morel, the truffle, are those most generally used for the table in England and in France; but in other parts of the world a large variety form luxuries, greatly valued by the natives of the places where they grow. Some fungi are intoxicating; others are extremely poisonous; but it has been stated, on high authority, that this quality varies exceedingly in different climates, and under the influence of different modes of preparation and cooking. The safest way, nevertheless, is not to venture on any whose wholesomeness has not been well ascertained. Some fungi are beautifully phosphorescent in the dark, and give the natural arches of certain mines the appearance of enchanted vaults teeming with indescribable splendour. The luminous fungi chiefly belong to the kind called *rhizo morpha*, so named because they assume the appearance of masses of roots. They abound in cellars and other places under ground. Rhizo-morpha is the matter of fungi developed in an anomalous condition. A curious example was lately placed in the author's hands by professor Henslow. It had grown on the woollen garments of a body, found in a coffin hermetically sealed in a deep vault of Roman construction. Sometimes it has been said that the hair has grown under such circumstances, but in all probability this appearance was merely the similar development of a species of rhizo-morpha; and, in fact, the one alluded to might have easily been so mistaken.

The parts of the globe in which fungi grow, ought not to pass unnoticed; for where the range of the thermometer is about the same, and climates are analogous, there is such an identity between the fungi, that it would be almost possible to draw *iso-fungal* lines on a map of the earth.

Many more observations are yet required on all the natural productions called by the common name of fungi. Some which have been long regarded as fungi are merely blisters of *acari*, or plant-lice; they are found on leaves of pear-trees, and, till examined carefully, would easily mislead the observer. Others, as for instance those bearing the name of *erineum* are only diseases of the superficial tissue of the leaves where they make their ap-

pearance. It is very essential, therefore, that we should show that diseases of plants attributed to fungi do actually proceed from them.

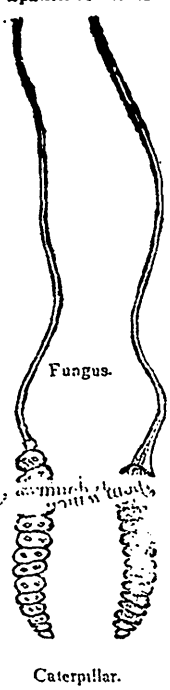
As may be conceived, speculations upon the fungi have been not a few. They have arisen out of their rapid growth, meteoric character, the increase of species under certain circumstances, the development of parasitic fungi only on particular parts of plants and nowhere else, and many other ascertained facts. But it is best at once to state, that the only *truth-like* solution of their source is the almost universal diffusion of their inconceivably small sporules, which are so numerous and minute, that it is not easy to conceive any place where they may not abound. They are ever at hand, only awaiting suitable conditions for springing up into existence.

It may be said of the great majority of the fungals, that one of such conditions is that they should find a *matrix*, or suitable place for their growth, of some organic matter in a state of decomposition. Herein again such fungi differ from lichens, which are often found attached to living parts of vegetables. Hence fungi have not unappropriately been designated "the scavengers of nature," as consuming those decomposing substances which would, if left to decay, prove injurious to the health of animals. This is one of those beautiful provisions of a merciful Providence, whereby a natural antidote is called into existence out of the very dangers themselves which arise from natural laws, and tends to beget in the Christian mind that veneration with which the gospel instructs us to regard such evident manifestations of wisdom and goodness.—When we look upon those singular appearances called *fairy rings*, in our meadows, we are apt to pass them by with a transcient, thoughtless glance, or a momentary wonder at their existence. But science has withdrawn the veil, and teaches us to perceive in them the presence of the *mycelium*, or spawn of the fungi, thus colouring the leaves of our grasses, and writing on the very surface of the fields the excellency of the great Maker of all. This dark hue is attributable to the spawn just mentioned; and the fungi to which it gives birth both consume putrescent organized matter, and manure the land.

This rule, like most others, seems to have its exceptions. The simplest kind of fungi are not, in the opinion of the highest authorities, confined to substances in a state of decomposition, but attack parts of plants and animals in full health and vigour. Nevertheless, it should be borne in mind that there are many who question whether the seeds of any fungi are, or can be, developed without some incipient alteration in the tissues of the subjects of their attacks. Once started, they increase the malady; and perhaps they may be started in such incipient stages of disease as to lead to the belief, in numerous observers, that they originate it. Both animals and vegetables may certainly be inoculated by the fungi which are peculiar to them. It is right, however, to say, that inoculation produces disease. The silk worm may thus have given to it the disease called muscardine. The fungus, from which this effect results is called *Botrytis Bassiana*.

In some countries, there is a species of wasp which is subject to the growth of a fungus, and is not unfrequently seen upon the wing with it adhering to its body. One of the most curious instances of a living animal thus infested was discovered in New Zealand. There is in those islands a caterpiller of a large moth, which inhales the sporules of a fungus called *Sphæria Robertsia*. When this happens the caterpillar buries itself in the ground, and the whole interior of the body is replaced by a black mass of spores. One of these generally seems privileged to grow, and rises from the nape of the neck of the caterpilar into a tapering fungus, as represented in the annexed figures. If by any chance this stem is broken off, another rises to succeed it; but generally speaking one only emerges at a time. Such an instance of an animal destroyed and replaced by a fungus, affords a striking proof that a retrograde step is sometimes to be found in the animal kingdom. The usual tendency in the insect creation is to an advance. Each change leads to a higher degree: the egg becomes the caterpillar, the caterpillar becomes a chrysalis, and the chrysalis is at length transformed into some beautiful winged fly, often seen glittering in vivid colours under the beams of the noon-day sun. The knowledge of such a transformation leads to reflections deduced from things present, on the future destiny of man. These thoughts are strikingly embodied in the following lines:

Sphœria Robertsia.



"Oh, start not! on thy closing eyes
Another day shall still unfold;
A sun of milder radiance rise,
A happier age of joys untold.
Shall the poor worm that shocks the sight,
The humblest form in Nature's train,
Thus rise in new-born lustre bright,
And yet the emblem teach in vain."

These beautiful expressions seem to give the Christian a natural shadow of a hoped for existence of a nobler kind.—True, the shadow is feeble, but yet it manifests that the promise of a life to come, is but a grander realization of that which things under our constant observation proclaim to be in unison with the proceedings of the Author of all existence in certain of the works of his hand. We see that such a declaration in his revealed word is in consistency with himself in his lower operations. Unimportant as are the transformations before us compared with our resurrection unto life, still it is most interesting to perceive that a faint type of it exists in the world. No longer then, can the sceptic stand upon the false position, that, from all that is presented to our notice, it is "incredible that God should raise the dead." But hitherto, while such facts have been adduced as auxiliaries to the believer's faith, no notice has been taken of the circumstances which, upon the same principles, may be brought forward as confirming, in their degree, the warnings of the gospel addressed to unbelievers. The reason is, that such a retrograde step as the one before us had escaped observation. Let us mark in it the fact that this caterpillar, under the agency of this enemy to its health, passes diseased into the ground and dies, while soon there comes forth from its decaying body the inferior replacement of a nauseous fungus. If, then, we are to learn a lesson from the former examples of ascent in the scale of existence, why not from this of unquestionable descent? Can we see no analogy here, comparing things small with great, and things natural with things revealed, of the going down of the ungodly into a state of life far below that in which they now are? If the inference holds good in one case, it does so in the other, and forcibly implies the possibility of those who are to the last under an uncured and unpardoned taint of sin, rising to shame and contempt.

Some kinds of fungi may be almost called terrestrial. Even in this country there is one (*cyphella*) which grows on little gravel-stones; and certain exotic fungi are found on tupha-like earth.

We have spoken of the *mycelium*, or spawn, of fungi, and the question may be naturally asked, what is it? It is merely the development of the spores of fungi, or the further increase of mycelium already produced. It varies much in appearance in the different tribes, being *mucedinous*, or *gelatinous*, or *vesicular*, as the case may be.

The cereal fungi have their mycelium present in healthy plants, and under favourable circumstances they are developed. These are the kinds to which attention will be principally directed in the pages of this little book, and they are extremely minute, requiring high powers of the microscope, as well as practised observation, to obtain accurate knowledge of their forms and habits. They generally appear in *sori*, or patches, consisting of multitudes of spores, that form frequently so many cases inclosing the reproductive sporules, which, as has been stated, float in the atmosphere around us until they light on some place adapted for their growth. Their extreme minuteness allows of their being introduced, by me-

thods hereafter to be explained, into the substance of the tissues of plants, or beneath the epidermis. As they grow on the leaves, or straw, of corn-plants, they raise the epidermis into curious puffy blisters, which they subsequently rupture, in the same way as the large toad-stools have been known to lift up the flag-stones of a paved street in a town in the process of their development. These patches are of different colours, but most commonly either deep yellow, brown, or black. The several parts of the wheat-plant are attacked by these parasitic pests, which are quite distinct from each other, having nothing in common, except that they germinate within the tissues. When the habits of these fungi have been fully described, the reader will be prepared for any concluding observations space may allow at the end of this work. At present sufficient has been said to open the way to a clear comprehension of the statements about to be made.

With regard to the insects which will come under review, no preliminary description is required, as the story of their encroachments includes that of their natural peculiarities, and we have only to deal with such as produce blight in the wheat, and may be called true parasites, produced in, and living upon, certain portions of the plant.

The order in which the fungi will be treated is the following:

1. Those attacking the *straw*.
2. Those attacking the *leaves* and *chaff*.
3. Those attacking the *flower*.
4. Those attacking the *grain*.

After these fungi have been traced in their growth and effects, a description will be given of certain extraordinary animalcule called *Vibriones Tritici*, or eels of the wheat, which render the grain abortive. Then will be introduced a review of that remarkable change in the grain itself which has been designated *Ergot*, from the peculirr form it assumes, and which is a subject deserving far more attention than hitherto has been given to it. Parasitic flies which devastate the wheat crops will form the next subjects of inquiry, to which will be added a series of observations, on matters connected with the principal topics embodied in these pages, made with a view to excite more inquiry into these and kindred subjects of deep interest both to the philosopher and the practical agriculturist.

From Bell's Weekly Messenger.

LONDON FARMERS' CLUB.

The monthly meeting of this club was held at their room, Bridge-street, Blackfriars, on Monday evening, Nov. 1st, Mr. Fisher Hobbs in the chair.

The subject for discussion is contained in the following questions, as appearing on the card:—"What evidence is there that dung is deteriorated by being dried up? And, if that state is proved to be injurious, in what way is the injury effected?" It was proposed by Mr. W. P. Taunton, but, in the unavoidable absence of that gentleman, Mr. Nesbitt, of Kennington-lane, Lambeth, who has attained to some eminence as an agricultural chemist, undertook, at a short notice, to bring it before the meeting.

Mr. Nesbitt began by observing that the question whether dung suffered anything from the action of drying was, *per se*, one of a very limited nature indeed. He thought, therefore, that the subject mentioned in the card must also mean whether dung exposed likewise to the action of the air lost anything; and, if so, to what extent? There were two points, then, for consideration: first, did dung lose aught by drying, and what? and, secondly, was it beneficial to expose dung on the surface of the land to the action of the air? Farm-yard dung was composed of vegetable and animal matters mixed with the urine and excreta of animals, and allowed to ferment and act upon one another. Heat was produced. Oxygen was absorbed from the air, and certain soluble and volatile substances were set free. The nitrogen and hydrogen of the urine and excrement were liberated in the form of ammonia. Organic acids were formed by the action of the air on the carbonaceous matter of the straw, and these acids, uniting with the ammonia, formed what was termed carbonic of ammonia; and to the extent to which this volatile substance was liberated from the mass of dung by drying, would be the amount of loss incurred. It was quite certain that, in this process of being dried, dung would lose ammonia. For the purpose of setting the question at rest, he had caused some experiments to be made,—the result of which was, that in the case of a pound of dung, which came out of Hampshire, the reduction was from 16 oz. to 7; that was to say, 9 oz. of liquid matter went off in evaporation, which was at the rate of half a pound of ammonia to the ton weight of dung. An experiment with other dung showed a loss of three-quarters of a pound of ammonia to the ton weight of dung. This, then, was convincing evidence that the drying of dung would cause the carbonate of ammonia to volatilise, and that to a considerable degree. Then what kind of manure lost the most of this element? One kind of manure which they all knew to be exempt from very great loss in the drying process, was dung or manure prepared in the ordinary mode, and exposed to all the rains and winds of heaven. That would be so thoroughly washed and cleansed that the loss by evaporation would be nothing at all. There was another kind of dung not to be deteriorated by drying, viz., that which had been too much fermented, too much heated, and made too short already. In the case of recently made dung, that had not suffered much by decomposition, the loss by drying would be somewhat smaller. If dung were prepared as it ought to be, so that the evaporation of the ammonia by too great a heat or its being washed away was prevented, such manure would contain the largest quantity of carbonate of ammonia, and consequently would lose the most in drying. There were methods of retaining the volatile qualities; and here the science of the chemist might step in with advantage for the purpose of telling them how this could be done, so that manure might be dried without loss. Ammonia might be "fixed" by gypsum, by sulphate of iron, or by diluted sulphuric acid. If they had dung in such a state as it existed under the feet of an animal in box-feeding, there it would not be too dry, and the application of gypsum would arrest the escape of the ammonia. Underneath cattle in the box-feeding system, they would always find the dung sufficiently wet to allow the gypsum to act. He denied that the escape of ammonia could be prevented without the use of gypsum in a case like this. Gypsum would always act where there was sufficient moisture; but if the manure were too dry, it would be of very little use. But here the sulphate of iron, or green copperas, might be resorted to, which would arrest the ammonia in drier mixtures than those on which gypsum would operate. If they strewed sulphate on a dry mixture, they would find it to act immediately in the absorption of the ammonia. Another means was the use of diluted sulphuric acid. A gallon of the acid, diluted with 30 gallons of water, and mixed with saw-dust, sufficient to absorb the liquid; this would prove a very powerful attraction to ammonia, and would take it even from the atmosphere, when exposed to it in the stable or other situation. This then might be applied where gypsum or sulphate of iron would be inoperative, or not prove of the necessary degree of utility; such, for instance, as in the case of sheep feeding in houses covered with wooden floors. The urine and the dung of the sheep falling through the floors, there was clearly great need for devising some means to absorb and retain the ammonia, otherwise the loss would be very great. By the use of this mixture, therefore, the ammonia would be sufficiently retained; and by working it up occasionally, say once a week, the loss would be but small. A more extended question than this was—was it a loss to the farmer to put dung on the surface of a winter fallow, turnips, or anything of that kind, and there leave it exposed to the atmosphere? The putting of dung on grass land and young clovers must not be confounded with this; because, in that case, the washing down of the soluble qualities operated on the plants and set them going. But the question was, what was the effect of putting dressing on land intended to be fallow for turnips; and was it better to leave it on the surface or plough it in? If the manure were left exposed to the air, the wind, and the sun, and it thereby became dry, there would be a loss of ammonia. Supposing, however, that rain fell instead, then the soluble and volatile substances were washed into the soil, and the loss did

not take place. Then came the question, if these substances were then washed into the soil, would there be any difference in results between drained and undrained land? Now, where land was undrained the probability was that the water rose to within a short distance of the surface; so that, if it rained to any considerable degree, the water would run along the surface, and thus carry off with it the soluble and volatile substances. In this respect there was much difference between drained and undrained land; the loss upon the latter would be doubtless greater than on the former. Take a four-feet drain, and the depth of rain at nine inches which was the average depth at Chiswick; that quantity of rain falling would seldom fill up the soil, but would carry the soluble and volatile matters down into it. So that if the rain did not fall in larger quantities, the probability was that these substances would remain there. In any case, however, the loss of ammonia upon drained land must be inferior to that upon undrained. But if the manure were ploughed into the land immediately that it was put upon the surface, they would thus have the volatile, soluble, and insoluble substances in the soil together. They could not pass out of it, and all the volatile and soluble substances which might be liberated by the further decomposition of the manure would remain, and no loss at all be experienced. Another question was, if manure left on the surface would absorb anything from the air, after the soluble and volatile substances were washed out of it; because, if it did, it might be regarded as a sort of compensating means to pay back what had been lost by evaporation. It was well known that charcoal and burnt clay absorbed a large amount of ammonia. Decomposed wood, old trees, &c., also contained ammonia; and there was no doubt that vegetable matter, straw, and other things, left upon the surface of the soil, would absorb a certain quantity. But would it absorb more in that position than it would have afforded to the land had it been ploughed in? On drained land, where the air was sure to permeate the soil, he believed the action of the manure would be better when ploughed in than on the surface; but on undrained soils the result would be very different, as the air could not penetrate the soil, so that the probability was that on the surface of that soil the manure would decompose much better, and furnish more ammonia to it, than if it were ploughed in, and became mixed with earth and water. With properly made dung, he thought greater benefit would accrue from ploughing it in on drained land, than from leaving it on the surface; for they thus retained all the soluble and volatile matters which would otherwise be given out in evaporation, or washed out by rains. Of course much would depend upon the quality of the dung. He was speaking now of good dung and good land; and upon the whole he was in favour of entombing the manure in the land. Exposure to the air for a little time would not be materially detrimental; but even if it were, it would be more than balanced by the extra labour which would be required, if they ploughed it in at a time when it was inconvenient to them to do so. But the sooner it was got upon the land and ploughed in, the better. One thing should always be borne in mind. They ought never to allow the dung to lie in small heaps, but spread it at once, though they might not be able to plough it in immediately. In heaps it would ferment, and if rain fell the soluble and volatile matters would be washed out around the heaps, and when the washed portion was afterwards spread, results would show that the ground had been most unequally manured.

Newcastle Farmer.

COBOURG, FEBRUARY 1, 1848.

The Proprietor of the *Newcastle Farmer*, in entering on another year with that publication, is desirous that it may be distinctly understood that it is his intention, if patronised as he has reason to believe it will be by the District and other Agricultural Societies, to enlarge it to double its present size, and to procure for its columns the very best selections from the writings of the principal scientific and practical Agriculturists of Europe, with so much of American procedure as may be applicable to the agriculture of Western Canada. And he believes it will be found to contain as much and as valuable information as can be found in any Agricultural periodical in the Province—and at half the price.

The Canadian Farmer, during the past year, has witnessed some most strange and anomalous proceedings, wherein he has been especially interested. The price of grain in Great Britain, (his only market,) has been higher than has been known for some thirty years; while the price in Canada has been lower, than in very many years of the interval.

The whole continent of Europe was exceedingly bare of breadstuffs; the exporters became importers, and bought in the British markets, thereby causing (in addition to the famine in Ireland) a much greater demand for Colonial produce, but still without any advance in price to the Canadian grower. The open arms of "Free Trade" were extended to the neighbouring "States," whose granary alone remained unexhausted, and England stood in the unenviable position of an unnatural parent, who casts off her progeny, to try the Quixotic experiment of inducing reciprocity of sentiment, by giving the children's bread to the stranger.

If we could be brought to believe that the ultimate result of these measures would be beneficial in general to the masses in England,—to the manufacturer, operative, and the Agricultural labourer,—then our repinings should for ever cease, as the interests of individuals, or the smaller portions of a community, must be sunk in any measure productive of general and universal benefit. But believing, as we do, that the *Peel remedy* was but a quack nostrum for ills he had not sufficient skill to remedy, or sufficient honesty to acknowledge as beyond his art, we feel we have been sacrificed, not to necessity or even expediency, but to folly and ignorant imbecility.

The occurrences of the past season, as interesting the Farmer, have been of the usual character, with the exception of an unusually protracted winter and ungenial Spring, which considerably retarded the operations of the farm, and threw those labours (which should be early accomplished) far into the summer months, so that the Spring grain (with the exception of barley,) suffered from want of moisture accompanied by the necessary warmth, required for vigorous vegetation; for, when rain did come, it was always accompanied by a decrease of temperature (as witness rain and snow on 15th June) unfavourable to the young plant of any description; from this cause, the turnip crop suffered much, by its slow growth rendering it, for a more protracted period, open to the ravages of the fly, involving a second sowing, which, when delayed until the latter end of June, is rarely successful; far better to be profuse of seed in the first sowing, so as to secure a full braird, to allow for insect depredations.

The meadows, too, were particularly backward, the grass scarcely getting a start before the middle of June, so that on the higher lands, the crop must necessarily be light.

The corn crop, although (at first) much retarded, improved amazingly, and turned out a full average crop.

The potatoes have doubtless, in some localities, suffered severely, and will be scarce for seed in the Spring.

The seasons of hay and grain harvest

were very favourable, and we think *little* will be heard about rust, smut, or "grown wheat," where common diligence and attention have been used.

Those farmer's pests, the wheat flies, of various descriptions, seem, (we regret to say,) on the increase; and it is to be feared that, unless some favourable circumstance occur (which we cannot command), that the next season they will be found more abundant than ever; and we do most sincerely hope that the pernicious practice of 'wheat following wheat' should in every possible instance be abandoned, as thereby a supply of food is carried to the very mouth of the insect to perpetuate its existence; and for this reason, were there no other against such a practice, it should be avoided.

We would hope, from the success attending the growth of the "white Belgian carrot" during the past season, that the next ensuing summer it would be brought into general notice, for "the yield" has far surpassed that of any other root crop, either of the field or garden, and we hope a good supply of *new* seed will be procured in sufficient time for sowing. While on this subject, we would remind the farmer, that *now* is the time to look out for all his seed for the ensuing spring; the matter is generally too long delayed by those who have to purchase, or change their seed; and just as the roads are at the very worst, we hear the enquiry of "Have you any peas to sell?" and, "Where can I find good seed oats, barley, &c.?" so that it often happens (with the negligent) that an improper cropping takes place for want of seed of the needful description.

There is yet one other subject we would take occasion to notice now, viz., the attending to putting all the farm implements into the most complete and efficient order, so that, when needed on the first opening of the Spring, there may be no delay by blacksmith, waggon or plough maker, who are always full of work at that season.

We believe a much smaller portion than usual of the wheat crop has found its way to market, and at the present ruinously low price, we should hope but little will be sold. And we doubt not but that in April and May, the merchant and miller will be able to offer a better price, than under existing circumstances they can possibly do. We know of no better way than (in order to make use of the sleighing when it comes,) to store the grain with the miller and make a bargain for the best price at a given time, say the first or middle of April; but this must be left to each individual, who will of course consider the chances, and use his own judgment in the matter. We are certainly of opinion that it must realise a better price than at present, first, because of the uncertainty of the English markets, and the certainty of their being fully supplied, on account of the monetary difficulties in England; and secondly, on account of the difficulty of getting bills discounted through our local banks; and thirdly, because the amount of discount, whatever it may be, will be chargeable on the grain sold, and not taken from the profits of the buyer. But there is yet another reason for the reduction: the year's accounts, (those confounded columns of ruled paper,) are to be balanced, and the quantity brought to market for that purpose alone will have a material effect in depreciating the value.

It would be well for the farmer (whatever he may think of it,) if there was not a credit store in the Province. It might be a pinch for a year, but after that, his produce would be *bona fide* his own, and not pawned for the last year's store goods. Then only would he make a successful stand, and his grain become the very best currency in the land.

For the Newcastle Farmer.

ANNUAL REPORT OF THE NORTHUMBERLAND AGRICULTURAL SOCIETY, FOR 1847.

Your Committee, in resigning their charge into the hands of the Society, would recapitulate the principal items of their transactions during the past year; and in giving up their stewardship, hope it will be found that they have not been unworthy of the confidence reposed in them; and should it be found that they have not been as successful as might have been desirable, that it may be attributed rather to circumstances beyond their control, than to any apathy or indifference on their part to the welfare of the Society.

Your Committee having deemed it unnecessary to have an exhibition of Stock &c. during the Spring, still conceived it would be needful to offer a premium of Ten Pounds for the best Stud Horse, to travel in the County during "the season." This, they considered, would be more advantageous than an exhibition of such Stock in the Fall, and be more likely to ensure the services of a more valuable animal; and it was, as you are aware, acted upon accordingly.

In order to meet the views of many members of the Society who were desirous of some local exhibitions, your Committee voted two thirds of the amount subscribed by any Township, to each Township Society where such existed, for the purpose of such exhibitions as the various local Societies should approve; and your Committee have reason to believe that the measure has given general satisfaction, and been beneficial.

Considering the importation of fresh Stock of good breed into the County to be desirable, and also that it would be advisable to make a trial of guano as manure, your Committee voted a sum of money for each purpose. The Stock, as you are aware, consisting of Devon cattle, was brought in and sold; and the guano is now in course of delivery.

Your Committee delegated three of their number to attend the Grand Provincial Exhibition at Hamilton, and to be present at the Meeting of the Directors of that Society, with instructions to use their most strenuous endeavours to secure for the County and District, the honour of having the next Exhibition within its limits,—which the Delegates, after much opposition, were successful in effecting; and the Exhibition is appointed to be held in *Cobourg* in October next. And your Committee hope that, as the honour of old Northumberland is in your hands, the utmost exertions will be used to come out in the most creditable manner, to the honour of the Society, the County, and the District.

Your Committee also, by one of their Resolutions, recommend that the Annual County Exhibition should merge into the Provincial, and that the required funds consequent on the necessary arrangements for the Exhibition, be furnished by the Society.

Your Committee, taking into consideration the circumstance of the proprietor of the *British American Cultivator* having increased the price of that publication to one dollar, the *full* amount of each annual subscription, propose the adoption of another paper in its stead. And an offer having been made by the proprietor of the *Newcastle Farmer*, to enlarge *that* paper to double its present size, and to make it every way worthy the patronage of the Society, your Committee recommend that the *Newcastle Farmer* be substituted for the *Cultivator*.

Finally, Your Committee rejoice to be able to congratulate the Society on the additional support it has received during the past year. Its subscription-list has been greatly enlarged, and new members being constantly added; and they especially recommend the continuance of Collectors,—those of the past year having rendered most excellent service to the Society, and are entitled to the warmest thanks of the Committee, who indulge the hope that the Society will very shortly be found to enrol as its members, not a small minority, but a very large majority of the Farmers of the County of Northumberland.

From the British Colonist.

SIR,—There appears to exist among farmers, in many parts of this Province, a very general apprehension that their late Wheat crop does not amount to more than two-thirds of that harvested the preceding year; and, indeed, in the neighbourhood of this town, there are numbers who assert "that where they reaped 30 bushels last year, they have this autumn scarcely obtained *fifteen*." The causes assigned are various; among the most prominent we find advanced:

1. The circumstance of its being "winter killed."

2. The destructive effects of the Hessian fly.

3. An abundance of straw, with comparatively little grain; or, to use the expressive language of the farmer, "that it is chaffy."

4. A predominance, in some localities, of what is termed "Chess."

The object of this communication is to bring before those of your readers who may have an interest in the subject, the present reasons and future remedies, which the science of agriculture affords, for the great "falling off" in this year's Wheat crop.

We have long been accustomed to hear the labours of the farmer described as being "at the disposal of the elements;" an expression synonymous with the ob soleto saying, that the life of the sailor is "at the mercy of the winds and waves." An intense frost, without the protective covering of snow, or an abundance of rain, when the ground is already saturated with moisture, may destroy the hopes of the unscientific farmer as effectually as the violent commotion of wind and wave place the life of an unskilful sailor in jeopardy. It is, however, the great triumph of man to arm himself against the extreme operations of nature, and to feel comparatively safe under all ordinary circumstances. When science and skill guide the helm, we may trust ourselves to the most boisterous waters; where science and skill attend the farmer, he may be assured that his reward is almost within the limits of certainty, under all *ordinary* circumstances; for it is a boon mercifully granted to man, that although he may not be able to control the operations of the physical agent, yet he possesses the power of greatly moderating the effects of their intense action, and of rendering them in a measure harmless.

We are subject in Canada, throughout the year, to very fluctuating temperatures; fortunately we have not to record many instances of deplorable results arising from long continued summer droughts, but the very variable nature of the temperature, during the commencement of winter and of spring, leads to frequent and serious loss, under the present system of culture generally established throughout the country; and when to the evil results which flow from causes over which we have *apparently* no control, are added the production of a useless weed, or scanty grain, in place of remunerating crops, it becomes a question of peculiar interest,—what resources do we possess for neutralizing the effects of the one, and preventing the occurrence of the other?

At the close of autumn, and at the return of spring, the physical condition of the soil is of immense importance to vegetation, and especially to wheat. During the apathetic period of the winter months, the conditions necessary to its future health and vigour are sufficiently satisfied, if the plant retain a normal state. If, however, for some weeks before the final sealing up of the ground by frost, and for some days after the return of the renovating warmth of spring, the wheat plant is not able to draw necessary nourishment from the soil, or permit its various parts to perform their functions in unison; it sickens, and in many cases it dies. In badly drained lands, the soil is saturated with moisture at the commencement of winter, and has been in that state for some weeks previous to the first sharp frosts, owing to the autumnal rains which invariably visit us. The sharp night-frosts bind up the surface of the soil, and by preventing evaporation, render the water contained in the soil beneath stagnant; the mere presence of water to saturation had, weeks before, expelled the atmospheric air, and thus, while the leaves are still slowly performing their functions under the influence of a November sun, the roots are incapable of properly acting in unison with them, or of drawing from the sources around them that necessary supply of nourishment which can only be indirectly afforded by the atmosphere. It is evident that, if a plant is in a sickly condition at the commencement of winter, it cannot successfully sustain those alternations of temperature which continually occur during the winter and early spring months.

(To be continued.)

From the Farmers' Gazette.

THIN SOWING.

One fact is worth at least one thousand speculative opinions; I therefore send you at foot the comparative results of two experiments with five pecks of seed wheat, *versus* eight pecks of seed wheat.

This is the third year of my experiments, and, as usual, the smaller quantity yields the larger return, besides saving the additional seed. In one case the saving is equal to the rent of the land; the corn was carted, thrashed, and measured in the presence of myself and the labourers, some of whom had made bets as to the results. The ground was accurately measured. I had several pieces with only one bushel per acre, which certainly were in appearance more productive than those with five pecks.

It will, no doubt, surprise some of the "old school," that my yield of wheat should on these two poor fields be between six and seven quarters per acre; but they must bear in mind that I *do not* waste my liquid manure, that I *do* subsoil, that I *do* drain four and five feet deep in stiff tenacious clays, that I *do* use linseed, and that I *do* grow wheat every other year on the same land.

With me the rule is "to sow thin," the exception "to sow thick" on a few stetches for the convincing of others.

I consider it a very grave reproach to agriculturists generally that they *assume* that thin sowing does not answer, instead of trying annually a few stetches in every field: surely the prospect of saving and gaining 14s. to 21s. per acre ought to induce them to throw aside the prejudices of their forefathers. It is a great national question.

A man who sows thin must make up his mind to be pitied and censured all the winter and spring by most of his visitors, and by all his labourers; but as harvest approaches he will see on the heretofore confident visages of mere practical men an amusing and peculiar contortion of dubiosity, and ultimately a humiliating but unwilling confession of defeat and surprise.

In the winter and spring the "thick sown" corn stands out in bold relief as far as one can see the field, and is triumphantly pointed to by the thick sower; but as harvest approaches, the "thin sown" gains ground, and, like a good horse, distances its exhausted competitor at the finish.

It cannot be said that this season was favourable to thin sowing; from November until the end of April vegetation was nearly at a stand still. My fox-hunting friends in March reported my farm to be like a "clean fallow;" letters of condolence poured in from every side; still I fancied I could trace in the apparent anxiety for my crops an occasional ill-dissembled smirk of inward triumph.

It afforded me much amusement one day in July, to see nearly one hundred agriculturists of eminence trying in vain to find out the thick sown stetches, although told of their immediate locality. It proves that the thin sown is thick enough at *harvest time*.

I think we must really consider this a settled question; at all events in the midland and southern counties of England. The only doubt as to the quantity of seed would be in the north of England, where the harvests are later. As the tendency of thin sowing is to retard the ripening about three to five days, it would be necessary to sow somewhat earlier. My wheat was all harvested by the 20th August, even where sown so late as November. I find, practically, that ample manure forwards the ripening.

As to the injury from vermin, much will depend on ourselves. The application of common salt, and the use of "Crosskill's" heaviest roller after sowing and the moment the crop appears above ground, and also at other more advanced stages of its growth, will effectually prevent damage. Where I neglected

th suffered; but still where only one bel was sown, and much of it destroyed b judicious spring harrowing and by worm, I expect near five quarters acre.

consider the great bulk of land in the ed Kingdom totally unfit for thin sing, in its present weedy, wooded, rained, and half-starved condition.

andlords, and tenants too, must alter stagely ere thin sowing can become the custom of the country;" on well cuvated and drained land it *must* aw.

me amusing incidents occasionally illurate very unintentionally the advanges of thin sowing. A neighbour of me, desirous of securing his plant of clover, sows one bushel of oats per acre; he finds that he gets so much straw that he thinks of going back (?) to three bushels again!!

From the Farmers' Gazette.

In a garden near ——— the diseased potatoes of 1846 were thrown out, with other refuse, from the potato-house into the dung-heap. A bed for parsnips was measured from the heap; potatoes never have been grown in the bed. Several potato-stalks have shot up among the parsnips; one of them was dug this day, and gave 14 lbs. of potatoes; 4 of them weighed 11 lbs., one alone weighing 4¼ lbs. Six other stalks from the same bed gave 32 lbs. of the finest potatoes; one of these weighed 2½ lbs. Many others were nearly of equal weight. The gardener states that none but black, rotten potatoes were so thrown out; in fact, he tried the experiment in another part of the garden, of planting potatoes which were quite unfit for human or animal food—black and rotten: nothing can be finer or more healthy than the produce of those diseased potatoes.

In the same garden a very small, poor description of potato has been cultivated for several years—it is called the "perpetual potato;" its only use is, that it supplies "new potatoes" at every period of the year. These potatoes varied in size, from that of a hen egg to a plover's. This year some of the stalks have produced potatoes of the size of the common grown potato—healthy and large.

Yours &c., S. M.

Mallow, Oct. 29, 1847.

[The fact of having sound tubers from parents diseased, is a proof that such disease is by no means hereditary. We would be glad to see some of the largest of these tubers. We once ourselves got a tuber weighing 5 lbs., but never could raise any of its progeny to the same weight. This enormous tuber was raised on the demesne of Lord Carew, county Wexford, by his late steward and gardener, Mr. Henley.]

From Bell's Weekly Messenger.

INCREASE OF WHEAT.

Sir,—I should feel obliged by your inserting the following extraordinary increase of wheat in four years. On the 24th of October, 1843, I drilled a field with red wheat. From this field I took on the 12th of August, 1844, three remarkably fine ears of red wheat with white chaff, all produced from one kernel. The three ears contained 312 grains, which I planted on the 25th of October, 1844, in the middle of a field of wheat. The produce was four pints and a half of fine wheat, which I planted on the 23rd of October, 1845, two rows on a flag, and a single grain in a hole, on a stitch 13 feet wide and 145 yards long. The produce was seven bushels one peck. Finding I had got a sufficient quantity to grow as much as would plant all my wheat land the following year, without planting it thin or putting it on my clover stubbles, on the 20th of October, 1846, I drilled it on four acres and a quarter of bean stubble, the beans not mucked for, and only 14 three-quarter-load carts per acre of mixed farm-yard manure laid on for the wheat, and no top-dressing in the spring, and to my surprise it produced 51½ coombs of very fine wheat. I drilled on my occupation, from the 21st of October to the 3d of November, 87 acres and a half (2 bushels per acre). Several friends have planted the remainder. One hundred and three acres are planted in all, and all produced from one kernel in four plantings.—I remain, &c.,

RICHARD GIRLING.

Kessingland, near Wangford,
Suffolk, Nov. 10.

CHASE OF A SHEEP-SLAYER.

Extraordinary losses have recently been suffered by the farmers in the district north of Preston, from tha remarkable sheep-killing propensities of a large and fierce dog, which roamed over the country at night, slaughtering sheep in every direction, and escaping by some unaccountable means the numerous snares which were set to compass its capture, dead or alive. Night after night did this mysterious brute pursue his course, creating alarm in every direction, and seemingly defying any attempt to check the mischief he was making; one morning the owner of a fine flock would ascertain that several of his choicest sheep were lying killed in his fold, and himself some thirty or forty pounds the poorer; and the next, a farmer so many miles distant as to warrant his fancying himself out of harm's way, would discover himself in a similar position. To such a height had the ravages of the brute proceeded during an entire month, that the "country-side" literally "rose in arms" against him. He was understood to be dark coloured of unusual size, and swift of foot; but that was all, and doubts were entertained as to whether it really was a dog or not, many being inclined to believe, from the description given of it, that it might be some wild beast escaped from a travelling menagerie. The excitement created naturally increased with every further account of the animal's deadly visits; and at length the farmers of the district felt themselves compelled to set watchers over their flocks every night, or to house every sheep, at whatever inconvenience, before dusk. In the early part of last week the farmers turned out, far and near, to the number of upwards of a hundred, armed with guns, pitchforks, &c., and completely scoured the district in search of their enemy, but without effect. On Saturday night, week, it was found that he had killed 12 sheep at Beacon-fell-side; and on the Sunday following, 300 or 400 persons were on the hunt for the destroyer. In the course of the day Mr. Logan, of Barton, got a distant shot at a large dog by the side of Barton-mill, supposed to be the one all were looking for, but the animal escaped unhurt. That night he killed 15 sheep at Catterall Hall. On Wednesday, at day-break, the brute was seen in the act of tearing a sheep's throat out at Woolfell's-mill, having five others lying dead about him. The cry was immediately raised; all within hearing turned out with such weapons as could be seized in the hurry and excitement of the moment; and the start was commenced with a determination to run "the game" to the death at every hazard. Numbers of others joined the pursuers as they swept across the country; and there then began a chase, and arose a cry, such as the "Pikes" and "Fells" of that district never witnessed, or echoed to, before. Across fields, over hedges, ditches, and walls, through gaps, dykes, and briers rushed the savage beast, perseveringly followed by his pursuers, resolved to have revenge. The news of the hunt spread on every side, and as those who had run longest failed for want of wind or strength, others supplied their places. Before the chase had lasted a couple of hours, many joined in it who had come distances of 10 and 12 miles. At one time it was feared the sheep-slayer would escape into the Fylde; but, fortunately, at Whinney-clough, and when he was gaining on his pursuers, Mr. J. Smith, farmer, got a shot at him, and, hitting him in the hind leg, turned him back towards Barnes-lane. It was now past 10 o'clock, and the pursuers, instead of slackening in speed or losing strength, appeared to increase in number and in spirit; while the dog, exhausted from his night's work, the severe run he had had, and loss of blood from the wound in his leg, showed evident symptoms of breaking up. At about half-past ten o'clock, seemingly worn out and terrified, the brute dashed into a house at Barnes-lane, in which was a woman and four children. The alarm of the poor woman may be imagined; but fortunately it was of short duration; for a young man coming up, armed with a pitchfork, drove the prongs through the ferocious beast; a second man, named Bleasdale, then cut its throat. Thus ended this extraordinary hunt, after a run of upwards of 20 miles. Upon examination, the animal was found to fall very

little short of the descriptions which had been given of it, exaggerated as they were thought to be at the time. It was of an unusual size, and very strongly made, especially in the fore-parts, its legs there being as big round as a man's wrist, and the print of its fore-foot measuring full three inches and a half across. Its death having been ensured, a cart was obtained, and the body placed in it was taken off in triumph to Goosnargh, followed by nearly a couple of hundred farmers and gillers.

From the Maidstone Gazette.

TRANSMUTATION OF OATS INTO WHEAT, BARLEY, OR RYE.

The statement of the Rev. G. Moore, at the dinner of the Sittingbourne Agricultural Association, having caused some interesting discussion, and, we may add, having been received with some little incredulity, we give the statement in the "Vestiges of the Natural History of Creation," alluded to by Mr. Moore. The author of the "Vestiges" says, in his fifth edition, whilst arguing against the persistence of the present systems of botanical species:—"After such instances, it will not be surprising that the specific and even (so-called) generic differences among the cerealia, are now discovered to be capable of reduction. It appears that, whenever oats sown at the usual time are kept cropped down during summer and autumn, and allowed to remain over the winter, a thin crop of rye is the harvest presented at the close of the ensuing summer. Perhaps the greater number of what may be called the domesticated plants are unsuspected variations of others, which, growing wild, are recognised as different species. One noted instance of such transition has been detected within the last few years, in the common cabbage of the garden. This plant, with its stout fleshy stem and large succulent leaves gathered into a heart sometimes reaching several feet in circumference, is now discovered to be merely an advance by means of external conditions from the wild kale of the seashore, which trails among the shingle with a tough slender stem and small glaucous leaf. After such an array of facts, can it reasonably be said that specific distinction is rigidly maintained in the current era?" This alleged fact having been doubted by a writer in the Edinburgh Review, the author of the Vestiges returns to the fact in his "Explanations," in which he says: "The objection of the Edinburgh reviewer, to the alleged transmutation of oats into rye, is that he believes it a fable. This is the opinion of one person, advanced without fact or argument to support it. Let us see, on the other hand, what a greater authority on botanical subjects than he—namely, Dr. Lindley—has stated on the same subject. "At the request," says this learned person, "of the Marquis of Bristol, the Reverend Lord Arthur Hervey, in the year 1843, sowed a handful of oats, treated them in the manner recommended, by continually stopping the flowering stems, and the produce, in 1844, has been for the most part ears of a very slender barley, having much the appearance of rye, with a little wheat and some oats; sample of which are, by he favour of Lord Bristol, now before us." The learned writer then adverts to the "extraordinary, but certain fact, that in orchidaceous plants, forms just as different as wheat, barley, rye and oats, have been proved by the most rigorous evidence, to be accidental variations of one common form, brought about no one knows how, but before our eyes, and rendered permanent by equally mysterious agency. Then, says Reason, if they occur in orchidaceous plants, why should they not also occur in corn plants? for it is not likely that such vagaries will be confined to one little group in the vegetable kingdom; it is more rational to believe them to be a part of the general system of creation. . . . . How can we be sure that wheat, rye, oats, and barley, are not all accidental off-sets from some unsuspected species?" The reader will now be partly able to judge of the value of the unsupported dictum of the reviewer.—There are many other facts that throw a strong light on transmutation, both of plants and animals. So far from there being any decisive proof against this theory, there is no settled conclusion at this moment amongst naturalists, as to what constitutes a species. 'There is,' says Professor Henslow, 'no law whatever hitherto established, by which the limits of variation to a given species can be satisfactorily assigned, and until some such law be discovered, we cannot expect precision in the details of systematic botany.'" The result mentioned by Mr. Moore is, therefore, not only not improbable, but is really likely to have taken place, for the concurrent testimony of so many other witnesses to the same fact, can scarcely be doubted.

From the Maidstone Gazette.

BONE MANURE FOR MARSH LANDS.

"Having seen in your paper of the 2d November an article in the column set apart for agricultural information, I shall be glad to know in your next what quantity of bone dust per acre is requisite for marsh land, since the excrement is not considered sufficient, what period is considered the best for applying the same, and if guano would do as well as bone dust? By your attention you will oblige, A. B."—Guano would probably act more rapidly on well drained soils than bones, because guano contains the ammoniacal salts as well as the phosphates, but it is proportionably less durable than bones. The question respecting bones will be answered by the following extract from the Rural Cyclopedia:—"Upwards of 600 acres of pasture land upon one estate in Cheshire have, within the last thirteen years, been raised, by the application of bone-manure, from a value of from 10s. to 15s. to a value of from 30s. to . The cost of the application has been ou £10 per acre; and 7 per cent. o added to the rent payable by the ten The manure is applied in pieces abou size of walnuts, in quantities of from to 35 cwt. per acre, and never upon lan which has been in grass for a less peri than seven years. It is most successf on old sour sward with a clay subso it never fails upon any strong swa which is free from surface water; and is also advantageous, though not to same degree or with the same unfail uniformity, upon dry friable pasture w a sandy substratum. "The end of Apri says the reporter of the Cheshire case, consider the best time to apply bones stock ought to be put upon the land fore the following spring. If the land is not too poor to produce a crop of hay, I do not object to its being mown the first year, but on no account afterwards. It is now twenty years since I first saw bone-dust applied to pasture land, on a field adjoining Lord Combermere's estate. At the time the bones were put upon the land, it certainly was not worth more than 10s. an acre; and though so long a period has elapsed since the field was manured with bones, it is now worth 35s. an acre, though I think the land is not quite so good as it was five years ago." The Doncaster Association gives from 20 to 30 bushels per acre of bone-dust as the quantity generally used. On old marsh land we should recommend 20 bushels, applied broadcast, as early as possible.

INSTANCE OF SAGACITY IN A HORSE.—It has been said that "preservation is the first law of nature," and never was that proverb more strikingly or more curiously illustrated than in the case of a horse a few days ago. A contractor on the railway at Sparkford bought two horses, which he put into a field with a bull; the latter, taking a dislike to his neighbours, gored one of them to death, but the other horse became so frightened that he leaped into an old saw-pit which was in a corner of the field, and buried himself up to his head in mud and saw-dust. The bull followed him to the pit's mouth, and there stood during the whole night watching his victim cowering beneath him in the pit. In this position they were found on the following morning by the owner of the horses. As soon as the horse perceived his master he leaped out of the pit, and ran to him for protection, exhibiting feelings of gladness at being delivered from the clutches of the dreadful bull.—*Western Flying Post.*

It is a fact perhaps not generally known that if an oyster-shell be kept continually in a kettle or boiler, it will prevent it becoming choked by what is commonly called *fur*; the deposit will adhere to the shell, leaving the vessel free.

Published by H. JONES RUTTAN, at the Office of "THE CORONNO STAR & NEWCASTLE DISTRICT GAZETTE" on the 1st of every month. TERMS.—2s. 6d. per annum.