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THE

# Canadian Agriculturist,

OR

JURNAL AND TRANSACTIONS OF THE BOARD OF AGRICULTURE

OF UPPER CANADA.

VOL. XIII. TORONTO, NOVEMBER 1, 1861. No. 21.

## Clover and Turnip Sickness.

In the older countries of Europe where clover d turnips have been cultivated as farm crops a great many years signs of decay have re- ily been manifested. Even the Swedish tur- -the hardiest variety of that useful root,— in several parts of England shown of late irs unmistaken symptoms of deterioration. over too, when brought round in a fourth rse of rotation, or the much vaunted system Norfolk husbandry, has been for many years coming more and more precarious. Indeed rendering this important crop more certain d remunerative it has been found necessary to ng it round in the rotation less frequently, d to dress it with manures more specially pted to its wants; and experience of late rs points out a similar way of treating the nip. We are not aware that similar results,— n in an inferior degree, have as yet taken ce in Canada; these crops have not been long ugh and so extensively cultivated by us as to produce any very obvious effects of this re, although by persisting in a system of rior cultivation, especially when the same p is frequently grown on the same land, a deterioration will doubtless be experienced. ly warning therefore becomes necessary.

is well worth being kept steadily in mind sickness in clover, and finger-and-toe in ips, are most common on inferior soils,— kinds, indeed, as grow a poor quality of roots and grasses, which is clearly to be attributed to the want of earthy matter with in reach of the absortive powers of the roots. It has lately been suggested that the roots of plants have to select as well as dissolve a large portion of their earthy food. These functions can only be performed when the condition of the vegetable matter within the soil is fitted to maintain the roots in healthy activity. When the supplly of earthy food is insufficient, we can easily imagine, from analogous facts, that the juices as well as structure of the plants are not in a healthy state. Under these circumstances insects and mildew appear, and the plants die of diseases having special forms and characters.

The want of a full supply of inorganic food within the turnip plant we consider as the cause of finger-and-toe. The particular insect which lays its eggs in the root, and gives the disease its form, through the infusion of poisonous fluids introduced into the sap of the plant, only does so when the plant is in an unsound state. It may look vigorous enough to the eye, while something is wrong within, which the insect can so nicely distinguish. It is of great importance towards attaining a knowledge of the exact nature of this and other diseases of plants, to bear this fact in mind. Mr. Duncan in a late number of the *Transactions of the Highland Society*, has given an admirable description of the fly which produces the swellings on the roots of the turnips attacked by the finger-and-toe. The progress of the disease is also most lucidly traced.

We quite agree with him that the "salivary discharge which accompanies the act of manducation" may be sufficient to produce the morbid growth, and laterly destroy the turnip. In fact the discharges by the insect have an effect by no means dissimilar on the turnip roots to that the sting of a bee or bite of a snake has on the animal system. The innoculation of the poisonous matter first produces swellings, which afterwards undergo further corruption and decay. The only practicable way that appears at present of remedying or rather preventing these maladies is the thorough cultivation of the soil and the proper application of suitable manures; and to allow the same crop to occur on the same land only at sufficiently long intervals. The careful selection of *pure and healthy seed* is alone of indispensible importance. Indeed it is to a want of attention to this indispensible condition that much of the failure in all farm crops is to be attributed. Impure or inferior seed of any description of crop would be dear a t.

## Management of Pigs when Fattening.

This should be commenced or preceded by a moderately good feeding, so as to get the pig in good store condition. To give a *poor* pig strong fattening food must, for a time, be attended by loss. The system is unaccustomed to rich food, and cannot appropriate it, because it has no fat cells ready to receive it. These would be produced by food of moderately good quality, after which the pig might have stronger food, and would be able to make good use of it. When meal is given to pigs for the purpose of fattening them, its *liberal* use is most economical. It should be supplied three times daily at *regular* intervals, and should be given as a thick paste. The feeder should give them as much, at each meal, as they will eat, and, should any remain in the trough, it should be shut off from the pigs by a movable flap, in which case they receive it with their next meal;—but the careful feeder will soon know what they can manage to consume, and regulate the quantity accordingly.

Afer feeding pigs they should be kept as quiet as possible, for the more they sleep the more progress they will make. It is a sure sign that they are not paying when fattening pigs are seen uneasy and wandering about the sty;—th sooner they are made lazy, the sooner the begin to pay. Our improved breeds have great aptitude for fattening, but this tendency regulated by the same principles that operate all other stock. The Suffolk and improve Berkshire may now be considered among th most popular breeds in Canada as well as Britain, coming early to maturity, and posse sing great fattening properties. It should a ways be borne in mind in the management swine that warmth, cleanliness, and regula feeding are, under all circumstances, essential profitable success.

## Canadian Flour.

[We insert from the *Globe* the following com munication on the importance of giving great encouragement to Flour at our Provincial E hibitions, and recommend the suggestions it co tains to the consideration of the Board of Ag culture.—Ed.]

Sir,—Canada West, by reason of its situatio its agricultural products, and its extensive wat power, seems to be peculiarly adapted to t operations of the merchant miller. From th country communications by water and railw are such, that our productions can with ease transported to any other part of the world search of remunerative markets. Wheat, o principal crop, is easily raised, and is of a *knowledged good quality*; *while the water-po* er is not only beyond calculation in amount, b is dispersed over the entire surface in such manner as to give to the remotest corners th "mill privileges."

Against this array of circumstances in t miller's favour, there exist certain disadvantag which in various ways have hitherto been t means of rendering their business very precari and in the main unremunerative. The Recip city Treaty, which put competence and indepe dence within the reach of every good farmer the country, altered the position of the mil *incalculably for the worse. Again, the* build of railways through the interior has so rai the value of wheat in remote districts, that various localities some mill properties have consequence become almost valueless.

But while the miller suffers from a course public events that can not by any means by tered, he may in most instances improve his o plans and method of manufacture so as to mak profitable use of his still numerous advantage

It is of immense importance that so pro nent a branch of Canadian manufactures that of flouring should received the attenti

om the proper quarters th t it deserves,—we ught, I think, to look to our Provincial Exhi tion as a medium through which a gradual but orough change may be effected, and ultimately lace the milling interest in a far better postion an it now generally occupies. At present hile the money permanently invested in mili operty may be counted by millions, adding im ense sums needful for carrying on the business, e manufacture of flour is recognized as an in strial art annually, by the awarding of two or ree prizes of from three to ten dollars each.

The main object to be attained by good mil ng is to get the best possible quality of flour t of the least possible quantity of wheat. A w possess the knowledge thus requisite to ake milling profitable, but a large proportion f those engaged in this business seem to be rking in the dark, make an inferior article, se their money, and bring discredit upon our oducts abroad. The Provincial Agricultural sociation has hitherto done nothing to coun eract this. The premiums, insignificant as they e, are not within the reach of our best brands ade for consumption, but to attain them a cou e of barrels are got up at considerable expense, ade from the choicest winter wheat, and of a ality made finer than is known in commerce, hich is of no practical use to the baker. As e bulk of our exports across the Atlantic are ring wheat flours, this system does not touch e evils complained of.

If liberal prizes were offered competition would ise, experiences would be interchanged, knowl ge would spread, the tyranny exercised by at are known as "boss millers" would give ay, and the proprietors would find that milling ot the mysterious art that we are required to lieve it by those gentlemen who, after going rough a seven years' apprenticeship in Eng d, to very little useful purpose so far as Ca da is concerned, come out to this country to y a salary of forty or fifty dollars a month.

In discussing this subject, let the gentlemen the Provincial Association remember they are aling with the most important branch of man ctures the Upper Province possesses. The rious grades of flour, each useful for its own rticular purpose, are regulated by Act of Par ment; excellence in each grade should be ught for, and prizes should be given to secure m. The following premiums may at first t appear large, but they are not in reality considering the magnitude of the changes t might be effected through their instrumen ity. I would propose a scale something as llows:—

$400 to the maker of the best 100 barrels of perfine.

$400 for the best 100 barrels of fancy.
$200 " 100 " of extra.
$200 " 100 " superior extra.

The flour to be stored in the public warehouse; e inspector to examine all and mark the grades, placing in the exhibition building four or five barrels from each lot as its representative. Superiority to consist primarily in the excellence of the flour itself for using and keeping qualities; also in the goodness of the packages, their weight and capability for withstanding rough handling and long carriage, and the neatness and fitness of the brand.

As the next Exhibition will be held in Toronto, a favorable opportunity will then be presented to give this plan a trial without putting to inconvenience the miller and shipper. A powerful incentive to some movement of this kind exists in the enormous loss sustained during the late summer of 1861 in Canadian superfines heating and souring on the voyage to England, by which it is supposed that fully two-thirds became unfit for human food. The consequent loss, although falling upon individuals in the first instance, was sufficiently large to affect the country generally, by sensibly diminishing the value of its exports.

The writer has at different times brought this matter in an informal manner before some members of the executive of the Association, and he has reason to think that united action on the part of the millers would cause the adoption, not perhaps of this individual plan with all its details, but of some one equally well, or perhaps better, suited to the end desired.

Your obedient servant,

F. A. WHITNEY.

Toronto, October 30, 1861.

## The Provincial Exhibition.

*From the Journal of the Board of Arts and Manufactuaes for U. C.*

(Continued from page 615.)

The fourteenth Exhibition was held at Kingston in the Building already described. The prize list amounted to $10,513; the entries to 4,830, being more than one thousand short of the number of entries at Toronto the previous year. Nevertheless the display was regarded as satisfactory, particularly with respect to live stock and agricultural products. Besides the cu tomary annual address of the President, lectures were delivered by Dr. Lawson, Professor of Chemistry and Natural History in the University of Queen's College, and by the Rev. Hannibal Mulkins, on Scientific Agriculture.

It has been remarked, in a preceeding paragraph, that the Association began its existenre in 1846, wholly without funds. In 1860, the auditors certified that they had examined the accounts, and found that the sum of one hundred and ten thousand nine hundred and eight dollars had been received by the indefatigible Treasurer, R. L. Denison, Esq., and that there remained a balance in his hands of eight thousand and twenty-eight dollars on the 20th Sept., 1859. What further illustration of the pecu-

inary prosperity of the Association is necessary?

Ten years ago the fourth Exhibition was held in Kingston. Compare the fourth with the fourteenth Exhibition, and see the progress of the country reflected in the results.

*Comparative Table showing the general results of the Exhibitions of* 1849, *and* 1859.

| | No. of Entries, 1849. | No. of Entries, 1859. |
|---|---|---|
| Blood Horses | 16 | 9 |
| Agricultural Horses | 97 | 235 |
| Heavy Draught Horses | .. | 34 |
| Durham Cattle | 54 | 68 |
| Devon " | 10 | 62 |
| Hereford " | .. | 7 |
| Ayrshire " | 12 | 62 |
| Galloway " | .. | 29 |
| Grade " | 51 | 38 |
| Fat and Working Cattle | 20 | 21 |
| Leicester Sheep | 79 | 90 |
| Cotswold Sheep | .. | 29 |
| Cheviot Sheep | .. | 12 |
| Long-wooled Sheep | .. | 55 |
| Southdown Sheep | 16 | 53 |
| Merino and Saxon Sheep | 11 | 17 |
| Fat Sheep | 5 | 9 |
| Yorkshire Pigs | | 11 |
| Large Berkshire Pigs | | 2 |
| Other large breed Pigs | 59 | 9 |
| Suffolk Pigs | | 23 |
| Improved Berkshire Pigs | | 12 |
| Other small breed Pigs | | 30 |
| Poultry | 22 | 179 |
| Foreign Stock | 39 | 22 |
| Foreign Implements | | 2 |
| Grain, Seeds, &c. | | 609 |
| Roots and other Field Crops | | 368 |
| Fruit | 224 | 252 |
| Garden Vegetables | | 349 |
| Plants and Flowers | | 123 |
| Dairy Products, Honey, &c. | 63 | 156 |
| Agricultural Implements—Power | 101 | 141 |
| Agricultural Implements—Hand | | 67 |
| Cattle Food—Manures | | 9 |
| Cabinet-ware | 18 | 85 |
| Carriages and Sleighs | 40 | 54 |
| Leather Manufactures | | 133 |
| Fine Arts | 78 | 165 |
| Groceries and Provisions | .. | 185 |
| Hats, Furs, &c. | .. | 46 |
| Indian work | 3 | 104 |
| Ladies' Work | 165 | 318 |
| Machinery, Metal Manufactures, &c. | 29 | 183 |
| Miscellaneous | .. | 84 |
| Musical Instruments | .. | 11 |
| Pottery, Building Stones, &c | 3 | 16 |
| Paper, Printing, Book-binding, &c | 7 | 17 |
| Woolen Flax & Cotton Goods | 99 | 170 |
| Foreign Manufactures | .. | 20 |

Hamilton had the honor of being the scene o the Fifteenth Exhibition of the Associatio one memorable from the circumstances that was visited by his Royal Highness the Prince o Wales. There is probably no site in the Pro vince finer than that chosen for the Hamilto "Crystal Palace." The building is of woo and glass, upon a permanent foundation. Th entire area of the building is about 36,000 feet the ground plan being octagonal in form, havin four trancepts. The building is two stories i height; the first story 16 feet in the clear, and the second 15 feet to the line of the eaves, wit an arched roof of light appearance. At the intersection of the cross is an octagonal space 76 feet in diameter, and 54 feet to the line o the roof, this portion is also arched in a most substantial manner; the roof surmounted with a cupola. The extreme height from the ground floor to the top of the dome is 100 feet, which is surmounted by a flag-staff 25 feet in height. The length of the building is 171 feet by 71 in width, and contains about 24,000 feet on the grounnd floor. There are four galleries, 54 feet wide by about 64 feet long, with a corridor running round the centre octagon, connecting all the galleries; these galleries contain about 12,000 square feet; four spacious stairways lead from the ground floor to the galleries. The diagonal which form the octagon are only carried up one story, with flat tin roofs—access to which can be obtained from the galleries—affording a fine place for a promenade, and a beautiful view o the city and bay. One of the galleries is re served especially for the exhibition of the fine arts—three of its sides are close boarded, and the light admitted through the centre of the roof by a lantern-light extending the whole length, the glass is frosted, or obscured in order to diffuse a mellow light. The whole of the glass throughout the building is frosted.

All the windows have semi-circular heads with cut trusses under the same. The whole o the wood-work, in the exterior as well as interior is planed or wrought, together with the cornices these cornices are supported at intervals wit fine cut brackets. The building is painted out side with a warm light color, or stone tint, oil, and it is intended to paint the interior fresco. The dome, covered with tin, render the building picturesque, and enables it to b seen a distance of several miles around. The gallery floor is dressed and laid open, and the under side of the galleries lined with dresse boarding, to prevent the dust rising. The cos of the building was about $14,000.

In the address of the agriculturists, artisans and manufacturers of Upper Canada to H Royal Highness, it was stated, that "This is the "Fifteenth Exhibition of the Agricultur Association of Upper Canada, and we think demonstrates to those who have witnessed t successive exhibitions from year to year, th they have been successful in stimulating the i

dustrial classes in the improvement of all those productions upon which the property of Her Majesty's dominions so mainly depends." His Royal Highness in his reply said, "Blessed with a soil of very remarkable fertility, and a hardy race of industrious and enterprising men, this district must rapidly assume a most important position in the markets of the world."

Of this exhibition an able reporter states, "The Exhibition of the Agricultural Association of Upper Canada, which has just been brought to a close, will long be regarded as a most brilliant epoch in the records of the Society. Closely connected with the visit of the illustrious personage, who made it the scene of his last public appearance in this part of the dominions of his Royal Mother, it possesses an historical interest which time will not readily efface, while as a memorial of the progress which we have made in those branches of industry most essential to our prosperity, it far outshines all that have preceded it."

We come now to the Sixteenth Annual Exhibition of the Association, that of the present year, when we enjoyed the opportunity of witnessing one of the most complete and successful displays which has yet taken place. In the ordinary course of events in Canada we naturally look for general progress in the staple industries of the country, notwithstanding years of depression and stagnation. One advantage of the periodical return to stated districts for the purposes of the Provincial Exhibition is the evident facility offered for making comparisons between the past and present, and estimating the amount of progress made in different departments near the scene where so much friendly rivalry and competition take place. It is not only reasonable to suppose, but it is a supposition well borne out by fact, that the merits of such exhibitions depend to a great extent upon the locality where they may be held. Proximity to the arena where competition takes place induces many to enter the lists who would be otherwise mere spectators of the rivalry of others. London is situated in the centre of one of the finest agricultural districts in the Province, and the expectation that all departments of husbandry would be fully represented, was more than realised.

The same object strikes different observers in many diverse ways. At the late London exhibition one fact could scarcely fail to arrest the attention of any visitor not wholly intent upon special subjects, but free to admire, or condemn, according to his unbiassed opinion.

While examining the workmanship we were unmindful of the workman. It was a rare sight to witness so vast an assemblage and look in vain among them for a single object seeking compassion or indicating poverty and distress. Within the limits of the exhibition, such would necessarily be vain on account of the admission fee, but outside the gates where a large crowd remained during the days when the exhibition was open, not only was there an absence of any approach to mendicancy, but the appearance of the individuals composing the crowd indicated perfect freedom from privation or indigence.—Not less surprising was the appearance of visitors of all classes and grades, but especially of those who are the bone and sinew of the country.—Thousands of strong and healthy looking men, the majority above the average height, spoke a language by their looks not to be misunderstood and far better than words, described the country of their birth or adoption. Another marked feature of the present exhibition was its truly Canadian character, owing no doubt to the troubles in which the United States are involved, our friends across the border were not present with their usual strength, and though we may regret the cause, yet it shows us that we are now fully able to organize and carry out an unusually successful exhibition among ourselves, without even missing extraneous aid.

We do not propose to enter into a minute description of the London exhibition, nor indeed is such the province of this journal, but in a succeeding number we shall be able to describe and comment upon such articles in the department of Arts and Manufactures as may appear deserving of special notice. For the present it will be sufficient to give a general sketch, the particulars being so fully and truthfully furnished by the daily papers of London, Toronto and elsewhere, and already no doubt familiar to the readers of this journal.

The building erected by the local committee was described in the last number, but for the sake of uniformity a brief notice is again given.

The exhibition building is erected in the vicinity of the Barracks, and within half a mile of the centre of the city, on a beautiful piece of ground of about twenty-six acres, a portion of which has been purchased from the Government by the Corporation for this purpose.

The ground plan of the building is a regular octagon, its dimensions from opposite angles, being 186 feet. The space offered by the ground area is upwards of 24,000 feet, while the galleries give an additional space of 4,000 feet more. The external wall is built of white brick, on a foundation rubble masonry and concrete, and is twenty-one feet in height. The entrance is through eight door-ways, each eight feet wide and fourteen feet high, one at each angle. In the brick wall, on each side of the octagon and between the door ways, are five spacious windows, making on the ground floor forty windows. The roof of this portion of the structure is covered with felting, gravel, &c. The second tier of the building, containing the gallery, rises to the height of thirty-two feet above the ground line, and is 114 feet in diameter from opposite angels, giving a wall accommodation of more than 300 feet, lighted with forty-eight windows, every alternate one being hung on a pivot to

admit of ventilation. The ascent and descent to the upper portion of the building is provided for by two stairways, one being intended for the entrance and the other for the exit of the public, and leading in opposite directions so as to divide the crowd. The third tier of the building is a continuation of the inside gallery wall, and runs to the height of forty feet above the ground line. This tier supports the cupola, and is covered with a shingle roof. The interior view is clear, and not interrupted by any timber to the height of eighty-seven feet. The full height of the building to the top of the flagstaff, is 114 feet; the dimensions of the cupola, twenty feet diameter by thirty-one in height; area of the ground floor and gallery 28,000 feet, being about the same area as the Hamilton Exhibition building, and 4,000 feet less than the Toronto building. The sheeting of the roof is printed a blue color, the timber a drab.

In expressing an opinion upon the manner in which the building served the purposes for which the building was designed, we desire to avoid the appearance of criticising without suggesting beneficial alteration which would not be attended by much additional expense. First impressions are always most lasting, and when one enters a building crowded with objects of industry and art with a view to study or enjoy or enjoy them, it is next to impossible to avoid being impressed more or less by the appearance of thy structure in which they are displayed.—The feeling produced on first entering the London Exhibition building is not a happy one. The gallery seems to drop like anopaque, dull, and heavy screen before the spectator, at once creating disappointment and a disposition to be adversely critical. The massive supports in front of each doorway, obstructing the view across the building, increases the dissatisfaction, and the cold drab colouring of the plain undecorated timbers bring no relief to the eye, but rather confirms impressions just created. Red, white, and blue are the natural colors for such a building, and there does not appear to be any valid reason why the gallery, which is painfully visible on entering, should not have been glazed and made instrumental in lighting the lower floor, and if not ornamental at least not an eyesore. Means, easily contrived, might with great advantage have been adopted for displaying a considerable part of the great variety of useful and ornamental ladies' work above the gallery, where close inspection is not necessary, general effect being the object aimed at.

Passing now to the objects exhibited in the building, we are at once struck with the number of competing sewing machines; it is not a little remarkable that this invention should have taken such wide-spread root throughout the United States and Canada, and, although only a few years old, has already reached such excellence in results. Some of these machines are very ingeniously contrived, and leave little to be wished for as household labor-saving machines. The furniture was substantial and good, but not particularly distinguished for beauty of design, although the materials are excellent and the workmanship superior. A reference to the illustrated catalogue of the Great Exhibition at London would speedily develope a more elegant description of drawing room furniture. The skill to construct is very evident, but taste to arrange is susceptible of improvement. It is very satisfactory to be able to note the taste for music, and the means of cultivating that delightful art, which appear to grow together in Canada. Piano fortes of Canadian manufacture were very well represented, a fact which of itself speaks well for the progress of our civilization. The collection of pipes and tiles for draining is another suggestive feature, and shows how the true principles of agriculture are spreading throughout the country. The specimens of pottery and earthenware were good, but this art is as yet in its infancy in Canada, owing to the remarable cheapness of the imported articles. There was nothing that may be called new in stoves, fire-grates, or apparatus for warming houses. In this climate one would naturally look for various designs for economising fuel and distributing a uniform temperature throughout our dwellings. The German tile stove, in its present elegant forms and excellent adaptations, does not appear to have attracted the attention of Canadian manufactures. The manufactures in leather were good and created a favourable impression, they included carriage and team harness, saddles, whips, belt leather, patent leather, leather, in a word, in all its forms and many of its adaptations. But we were disappointed with the small display of manufactures in wool, flax, and cotton. We observed only cloth, winter and summer tweeds, blankets, carpets and couterpanes, woollen garments, flannel kerseys, woollen shawls, shirts, stockings, socks, and an assortment of cordage and twine. Many well known names were not among the exhibitors. Our flax and cotton manufactures had no representation; we know they exist now, but why were they not sent to our Provincial Exhibition?

The display of fruit, considering the season, was magnificent. The flowers were indifferent, but the vegetables were good and showed both improvement and skill. In horticulture immense strides have made of late years in Canada.

The agricultural implements were very numerous and most of them of Canadian manufacture. Ploughs of many varieties, from the simple wooden implement adapted to the bush, to the drain plough for skilful and scientific husbandry. Subsoil, draining, and double mould ploughs are indicative of progress; where these implements are common, agriculture is in an advanced state. Mowing, reaping and other machines of this class were not so fully represented as

might have been expected, but they are generally very ponderous and expensive to transport to great distances. Of cultivators the variety was also not in excess of former exhibitions. One important machine deserved particular notice as indicating progress. An improved liquid manure drill for drilling two or more rows of liquid with turnips, mangels, carrots, &c., either on the ridge or flat. The use of liquid manures is of the utmost importance, and a machine to distribute them economically and uniformly is a great desideratum. The stump extractors were heavy cumbrous machines, wholly inapplicable to general use, especially when a stump extractor of far more simple character can be rigged by any farmer on his land with an ox chain and a long maple, elm or pine stick to act as a lever. The lever, which should be some fifty feet long, is fastened to the stump with a chain, and to the other extremity a pair of oxen or horses are attached, which rapidly twist the stump out of the ground. The minor implements used in husbandry are very numerous and of good construction, many of them having a finish highly creditable to the manufacturers. Bone manure in different sizes was present, but no superphosphates made from bones by the addition of sulphuric acid. This is one of the most valuable special manures, and should receive careful attention. Too much thought is apparently bestowed upon the multiplication of agricultural machines, to the neglect of those artifices whereby the fertility of the soil is maintained and increased. As we cannot always depend upon rotation of crops to fertilize our fields, we must look to manures, and after properly prepared farm-yard manure, bone dust and the phosphate from bones are the most valuable.

Two portable steam engines were on the ground. This is another advance promising much for the future. In a report from the committee appointed by the Board of Arts and Manufactures, relative to the Great Exhibition held at London in 1862, particular attention was directed to the products of our forests. We are glad to see that a very excellent beginning has been made by Mr. Saunders of London, who displayed a very good collection of native medicinal plants, all of which were collected in the neighborhood of London. We would suggest in the future displays of the kind, the entire plant, if portable, should be exhibited, and when too large for such a purpose, a portion of the trunk, and specimens of the leaves. The Fine Art department was, on the whole, indifferent. Among a few paintings and drawings of superior merit were some wretched caricatures, for they were nothing better, displayed in painting in oil or water colours. Steps should be taken at future Exhibitions to make some selection before giving space to productions which might decorate the parlour of a remote country inn, but should not be admitted in a Provincial Exhibition as illustrations of provincial art. Of the Ladies' work we have little to say: the most imposing contributions were the quilts, not differing in any marked particular from former specimens. A little attention to the selection of patterns, and the proper combination of colour, would be attended with advantage, and destroy, perhaps, the uniformity which appears to prevail in those particulars.

The Natural History department received considerable attention, and was represented by Canadian stuffed birds, native fishes, native insects, mammalia, native plants, and specimens of the woods of Canada in section and with the bark; also that delightful source of amusement and instruction, an aquarium, was exhibited.

It does not come within the province of this journal to describe the farming stock; but it would be unfair not to express both gratification and surprise at the display. In every department there was a marked improvement, and all evidently in the right direction. There cannot be a doubt on the minds of any one present at the Exhibition that astonishing progress has been made in Canada in this department of husbandry.

The Address was delivered by the President of the Association, John Barwick, Esq., of Woodstock, who took an enlightened view of the importance of giving every encouragement to home manufactures. Mr. Barwick said in his Address:—

"Our aim should be to foster Canadian manufactures of those articles that we can advantageously produce. Every Canadian will concede that it is of great importance that our towns should be occupied by thriving mechanics and manufacturers, thereby giving to us a home market. How many of the youthful population of our towns and villages might be advantageously and economically employed in woollen and cotton factories who are now, in too many instances, a burthen on their parents, and at the same time it is to be feared are in a course of training to become vicious members of society. The crop of wool for this year has been principally purchased for exportation to Great Britain, heretofore it has been exported to the United States to be there manufactured. Flax and hemp are certain and very productive crops in Canada, and might be advantageously grown for manufacturing purposes."

Mr. Barwick also said that "a very excellent suggestion was made in the September number of '*The Journal of the Board of Arts and Manufactures for Upper Canada*,'—'That a museum of natural products, both mineral, vegetable, and even animal, might rapidly be formed at each permanent Exhibition Building.'"

The amount of prizes given by the Association this year exceeded $12.000; the number of entries was above 6.000. On Thursday, the day on which the public were admitted at a reduced charge, the number of persons who passed through the exhibition building exceeded fifty

thousand. We are probably, within the mark, when we hazard the opinion, that there were between fifty and fifty-five thousand visitors present. It would be premature to institute any comparisons, based upon statistics, between this and preceding Exhibitions. It is sufficient to say, for the present, that it far exceeded general anticipations; that it was well arranged, well sustained, and was a flattering and cheerful exposition of the progress of the country in wealth, industry, and civilization.

## The Wheat Crop.

(*Continued from Page* 618.)

Of the red varieties, the following are those generally preferred:—

*Burwell.*—Straw long, stout, and coloured; ear large; chaff coarse and deep coloured; grain long-shaped and dark; sample generally good; large cropper, and very hardy.

*Browick.*—Straw long and stout; ear bold and full; less colour than the foregoing; grain short, plump, and well shaped; skin moderately thick; very productive and hardy; sample generally classed among the finer varieties.

*Bristol.*—Very similar in character to the Browick; straw long; grain rather coarser and longer; very hardy, yield generally good; sample inferior.

*Clovers.*—Straw long; grain and chaff stout, but of a lighter colour than the preceding; sample fair; good cropper.

*Hickling's Prolific.*—Straw long and stout; ear large, and of a compact square form; grain short and roundish, of a deep yellow colour; chaff white; yield large, but of inferior quality.

*Kessingland.*—Ear large, dark yellow colour; somewhat coarse, but very productive.

*Lammas.*—One of the best varieties of red wheats, grain dark coloured, plump, and fine skinned; straw stout and clean; should be cut early, to prevent shelling; sample good, and liked by the millers; fair cropper.

*Piper's Thickset.*—Straw short and tough; ear square and compact, tapering towards top, with awns which gradually fall off when fully ripe; grain round, and redish in colour: sample fair; yield large.

*Spalding's.*—Straw long and stout; hardy, and very prolific; grain large, oblong shape; good average quality.

*Velvet or Woolly-eared Bearded.*—Ear long, dark red colour; grain large flinty, and coarse; chaff hard and close; difficult to thrash unless in good condition; early, hardy, and prolific.

The species *Triticum sativum* was formerly called *T. vulgare*, and was frequently divided into two classes—the winter, *T. Hibernum*, and the summer, *T. æstivum*. This classification is no longer recognized, as it is now well known that wheat, by being constantly sown in the spring, quite changes its habits as to time of ripening. The produce of wheat sown in the spring acquires the habit of perfecting its growth quicker than the produce of the same wheat sown in the autumn. Hence the farmer when he sows wheat in spring should be particular to obtain seed the produce of spring grown grain, and not the produce of that sown in the autumn. The same change takes place in all the cereals, and in other crops which we cultivate. The difference also in colour between the red and white varieties is probably due mainly to the nature and character of the soil in which they are grown. Fine white wheats gradually become darker and coarser, and ultimately change their colour altogether when grown continuously on cold, ungenial soils; while the coarser red wheats grown, year after year, on rich, warm soils, in a good climate generally lose their characteristics, become lighter red colour, than yellowish, and finally assume the external appearance of a strong white variety. It has been remarked that the grain in this respect is affected differently to the straw, in changing its colour and character more quickly than that does. Hence we have many varieties of red wheats with white chaff and straw, and varieties of white wheats with red straw — the chaff and straw retaining their colour after the influence of cultivation has affected a change in the grain.

In the foregoing, and all the other varieties of *T. sativum*, the straw is cylindrical in shape and hollow. In the following species, the *T. turgidum*, and its varieties, the interior of the straw is occupied more or less completely by a pithy substance, which gives it toughness and strength; and the grain or seeds have a less regular and symmetrical shape than those already described.

The varieties of Turgid wheats are generally hardy, vigorous, and very productive, with long tough, coarse straw. Having a low nutritive value, and being unpalatable to cattle, it is unsuitable for fodder; but where straw is in demand for thatching, litter, or similar purposes this description of wheat usually is found to be more remunerative than the finer qualities, especially in cold and heavy soils. The ear is always bearded (awned). In some varieties the awns fall off as the grain approaches maturity and thus a difference in appearance is given to them. The soils best suited for these wheats are the strongest and richest clays, in which we so often see the ordinary wheats go down towards harvest time—their stout, tough straw being fully capable of standing up against the action of ordinary weather, notwithstanding the size and weight of its ear. They all require to be sown in the autumn, and are always backward at harvest; therefore are more suitable for early than for late districts. The yield is great, averaging probably one-fourth more than that of the ordinary wheats. The grain, how-

ever, is very coarse; and as it is only used for one department of baking, the demand is very limited, and the market price generally very unsatisfactory.

The following are the varieties usually met with in cultivation:—

*Rivet, Common.*—Ears smaller and less compact than the next variety; awns stay on longer; grain long and flinty; heavy cropper, but being somewhat later at harvest than the Cone rivet, is only suited for early districts.

*Rivet, Cone.*—Ears white and velvety, square and compact: grain whitish yellow, and larger than the common rivet; straw, bold, long and stout; generally hardier, and less liable to diseases; sample poor in quality; yield very productive.

*Egyptian.*—Ear woolly; straw long, stiff, and filled with pith: differs from the other varieties of Turgid wheats by the form of its ear, the lower florets being elongated, and forming in appearance, distinct ears. This is the variety so frequently met with under the name of "mummy wheat." It is like the others, a very productive sort, but of a like inferior quality.

At the Exhibition of 1851 specimens were exhibited of *hybrid wheats*, obtained by the systematic crossings of different known varieties, and prize medals were awarded to the successful experimenters. 'The specimens excited great interest from the importance of the process in other departments of the vegetable kingdom, and the known difficulty of hybridizing the *cerealia* in particular. This arises from the great care required to extract unexpanded anthers from one parent, and to replace them with the pollen of another—preventing at the same time, the stigmas to be fertilized from receiving any other pollen than that artificially applied, and guarding them afterwards, from the attacks of birds, and a variety of disturbing operations. The result appears in most cases to be an offspring stronger than either parent." (Jury Report on Class III).

In discussing the agricultural relations of wheat, the *soil*, of course, claims our first consideration. Wheat we know, has a very wide range of soils. In this country we see it grown on well-nigh every variety, from the light siliceous soils met with in the eastern counties, and on the green sandstone and the new red sandstone formations to the difficult and disheartening soils of the London, the Wealden, the Oxford and the Lias clays. Some soils however, are clearly more suitable for it than others. Those best adapted for it are, of course, such as contain the ingredients necessary for its growth and perfection in the best proportions, and in a condition most available for the plant. We know that wheat will not flourish in any soil unless there is a certain amount of silica and potash for its stem, of silica and lime for the chaff or outer covering of the seed, and of potash, phosphoric acid, magnesia, and ammonia for the seed. These substances are generally found to exist in clays to a greater extent than in other descriptions of earth; consequently, we are accustomed to look upon our different soils as strong, medium, and light wheat soils, according to the proportions of clay they severally contain in their composition. *Pure clay*, which is a chemical compound of silica and alumina, would be unsuited to any description of vegetable growth; but clays are always more or less mixed up with other substances which give them their fertilizing value, while their own substance acts mechanically in a very beneficial manner, by giving tenacity—staple—to the soil, and by increasing its powers of absorption and retention of moisture, and also of condensing and retaining the ammonia so necessary for plant life. In soils containing large proportions of sand, or of organic matter, but deficiency in clay, we often see the young plant very luxuriant at first, but without the power to build up its stem, and consequently unable to assimilate those substances necessary to perfect its growth and to produce its seed.

In all descriptions of soils it is essential that they should not retain more moisture than is natural to their composition—that all the surplus should be got rid of by drainage, as, owing to the habit of the growth of wheat under suitable conditions, it requires less moisture after it has once sent out its roots than most of our other crops.

The preparation of the land for wheat depends very much upon the character of the soil and the general practice of the district. In some of the unmodified clay districts, especially if undrained, of the London clay formation, as in Essex; of the Wealden in Kent and Sussex; of the oolite clays in Oxford; and of the lias in Gloucester and Worcester, it is still the practice to give it a summer fallow, keeping it well stirred and cleaned, and sowing it down early in the autumn. This expensive and unphilosophical practice is, however, gradually disappearing as thorough-draining makes its way into the districts, and as the farmers recognize the immense advantages which the rapid development and adaptation of mechanical power, in the shape of farm machines and implements, now place at their disposal. Except under very rare circumstances, we should not admit the practice of an open fallow as a necessary preparation for wheat; but we should endeavour to occupy the ground profitably, by a crop which would take from the soil such ingredients as the wheat will not require, and which would leave in the soil behind it sufficient organic matter to satisfy the demands of the succeeding crop. This may be readily secured to the soil by growing a green crop, either a regular fallow crop of roots, as turnips, potatoes, &c., or a forage crop, as clover, such crop being determined either by the particular character of the soil or by the practice of the district. If the

soil be of a light, friable character, the Norfolk or four-course system (wheat after clover) is generally followed, the spreading roots of the clover giving that firmness to the soil which experience has shown to be so desirable for wheat. On such soils, too, the roller, either plain or ribbed, is a good friend to the farmer: it closes the surface, stops evaporation, and consolidates the body of the soil generally.

On strong lands, again, root crops are certainly the best preparation for wheat, provided the land can be cleared in time to allow for wheat sowing. In the north and other districts, where the five or six course system is carried out, either turnips, or potatoes, or mangel precede the wheat. All form good fallowing crops, allowing the land to be well cleared, requiring to themselves mineral ingredients different in proportions from the wheat, and at the same time leaving on the land a supply of organic matter for its use.

On very heavy soils root crops are rarely attempted, owing to the difficulty in obtaining a sufficiently fine tilth for the seed-bed, and also to the difficulty in getting them off the land before the bad weather sets in. On such soils beans are sown alternately with wheat. This rotation, though suitable as regards the chemistry of the two crops, has one great fault, that of preventing to a great extent that mechanical treatment of the soil which we know adds so much to its fertility. The bean stubble is ploughed in with its accumulated weeds; the wheat sown, and generally, on such soils, left unhoed until harvest; the ploughs are sent in again as soon after the field is cleared as possible; manure either ploughed in now or before seed-time in the spring, and the land is left for the winter fallow. In the spring the first chance of getting the beans sown should not be lost; and the only opportunity of getting the land clean is during the early period of their growth: and then the chances of weather on strong clay soils are considerable against you, and the weeds remain masters of the field, until a twelvemonth's fallow and a large expenditure in labour again clears your land of those unprofitable occupants. The addition of a third crop to the rotation, which would admit of a better preparation of the land, might be obtained in the smooth-leaved rape. This on such soils, grows well; it admits of the land being well worked and cleared before sowing, and of being kept clean during its growth: it comes to maturity early enough to be fed off by the end of September, and leaves a large amount of good dressing for the succeeding crop of wheat. The good effect of the extra tillage in cultivating root crops is always shown in the succeeding wheat crop; and although different practices prevail necessarily in different districts, still, as a general rule, a farmer cannot deepen his soil too much, nor reduce it to too fine a tilth, in preparing it for the reception of his wheat.

Having, then, to the best of our judgment and our power, completed the preparation of the land, the next point for consideration is the *selection of the seed;* and this is a point of far more importance than farmers are generally disposed to concede to. We have no series of properly conducted practical experiments to refer to, which are always desirable in cases where scientific principles are so opposed to general practices as in this instance; but to those at all acquainted with natural history—the laws of animal or vegetable life—a little consideration would clear up any doubts they might before have possessed in reference to it. We may be told, it is true, that good seed does not produce a good crop, while the produce of inferior seed is sometimes of a superior quality. This may be quite true, and there may be many other ways of accounting for the result beyond the mere difference in the seed; but as a rule, the law of production—"that like produces like"—cannot be disregarded; therefore if we wish to secure the best results, it is important *that the seed sown should be of the best quality—that it should be perfect in itself—and that it should be fully matured.* The temptation of the higher price too often takes all the best grain of the farm to the market, while the inferior qualities, including the tail corn, with all its immature and injured grains, are, with a sadly short-sighted economy, considered good enough to risk the next year's crop upon.

Another point to be attended to in reference to seed corn is the advantage of changing it as often as circumstances will permit for seed grown in a different district, both as regards soil and climate, from your own; as seed constantly produced year after year on the same soil is apt to deteriorate in quality, and to produce a crop less vigorous and more liable to disease than if its conditions of growth had been frequently changed.

This practice of changing seed is becoming every year more followed, experience satisfactorily confirming the correctness of its principles. Not only is a more healthy plant secured, but an opportunity is offered to the farmer, by using as seed the grain of an earlier district, to accelerate the time of his own harvest, which in some seasons and in some places is a matter of considerable importance to him. Thus the light chalk and gravelly soils of Kent furnish a good exchange with the strong alluvial and clay soils of the opposite coast of Essex; and the fen soils of Huntingdon and Lincolnshire exchange seed beneficially with the wolds and chalk soils of Cambridgeshire and the green sandstone soils of Bedfordshire; while the strong, cold clays of Northumberland and Berwickshire, and the rich alluvial carse soils of the north would find the seed corn of the warm, friable soils of the new red sandstone improve the wheat produce of their broad and well-tilled fields.—*Our Farm Crops, by* John Wilson, F.R.S.E.

## Deposits of Guano on the Coasts and Islands of the Pacific Ocean.

*Translated from the French of the "Journal D'Agriculture Pratique" expressly for the "Mark-Lane Express."*

The deposits of guano (*huano de Pajaro*) are distributed on the coast of Peru between the 2nd and 21st degree of south latitude. I saw the first deposits in the Bay of Papta. In advancing towards the south we found it at intervals up to the mouth of the Rio Loo. Beyond these limits guano is still met with—sometimes even in great abundance; but in that case it is nearly deprived of its ammoniacal salts and the organic principles to which it owes a great portion of its valuable properties.

In passing from the south towards the Equator the principal *huaneras* are those of *Chipana, Huanillos, Punta de Lobos, Pabillon de Pica, Puerto-ingles Isla Patilos, Punta Grande Isla de Iquique, Pisagua, Ilo, Jesus y Cacotea,* and the isles of the Bay of Islay.

Between Islay and a point situated at some leagues from Pisco, the *guano de pajaro* (or bird guano) is unknown, the waters being principally frequented by seals, porpoises, and sea-wolfs (*hobas*). The masses of guano, too—otherwise limited—which are found in these quarters, are almost wholly formed of the excrements and skeletons of these animals. The guano is deposited on small promontories and and cliffs, filling the interstices. In general, it is in such places the birds find a shelter from the breezes of the south.

The rocks of this part of the coast consist of granite, gneiss, syenite, and porphyritic syenite. The guano they contain is most often found in horizontal beds; sometimes however, they are strongly inclined, as at *Chipana*, where they are become almost vertical. In certain *huaneras* we noticed a mixture of the excrements of birds, and of those of fishes or cetacea (*lobos*). M. Francisco de Rivero particularly noticed this mixture at *Punta de Labos*, where, upon strata of a dark grey guano, he found superposed thin strata, almost black, of the thickness of two feet, covered over in their beds by various colours. The black stratum is filled with small stones of porphyry, shining and elliptical, which the seals are in the habit of swallowing, and which are always found in their dejections.

The deposits of guano are commonly covered over with an agglomeration of sand and saline substances—the *caliche*, which the workmen remove before commencing operations. On some points, as at *Pabillon de Pica* and *Punta Grande*, the bed is below a mass of sand descended from the neighbouring mountains, and nothing proves better its antiquity in this locality than an observation made by M. F. de Rivero. Upon the rock which serves for its base we find horizontal beds of guano supporting a stratum belonging to the ancient alluvium, of three yards thick, and in which we find impressions of marine shells; and upon this alluvium, contrary to what ordinarily occurs, are placed many strata of guano, covered over with sand of the modern alluvium.

In general, the working of guano is carried on openly, after uncovering the bed, by taking away the crust of *caliche;* but in the *huanera de Chipana* it is worked by subterraneous galleries driven under the saline and arenaceous agglomerate.

In the *huanera de Punta de Lobos*, the *guano de Pajaro* lying in horizontal strata slightly undulating, is of a very dark brown, and enclosed with *guano de lobo*, such as the bones of dolphins, seals (*lobos*), and the polished elliptical stones which characterize the excreta of those animals. They attack the mass with the pick and gunpowder. The guano, put into sacks, is shipped upon rafts (*valses*), to be afterwards transhipped into small boats (*guaneros*. The workmen receive a piastre (3s. 9d.) per day, food and fresh water, which they are obliged to fetch from the *Rio loa*, when the ships coming to load do not bring it.

The *huanera de Pabillon de Pica* takes its name from the village of Pica, thirty leagues in the interior. It is a conical mountain, 325 metres (355 yards) of altitude. The crystalline rock, which is traced halfway up, is covered with a modern sandstone perfectly characterized. The depth of the strata of guano, superposed on the sandstone, is from fifteen to twenty *varas* (from twelve to sixteen yards). The most esteemed produce is found in an escarpment of two hundred *varas* wide, which covers a mass of sand. In the inferior zone the strata are separated by an ancient alluvium of two or three *varas* in thickness, and of great hardness. Sixty workmen are established on the *huanera*, the roadstead of which is deep enough to allow the boats (*guaneros*) to anchor at twenty-five *varas* (twenty yards) distance from the wharf.

To the north of Iquique are three Chincha Islands, the richest in ammoniacal guano, in 13 degrees south latitude, and lying south and north. Their summits do not exceed 110 *varas* (about ninety yards). The granite base is surrounded with reefs—so much the more dangerous for navigation that there almost constantly prevails a destructive wind (*al paraca*), from ten or eleven o'clock in the morning to the sunset. The reflection of the sun and the dust raises the temperature in a singular manner. The workmen only work at night.

The guano lies in horizontal strata, most commonly undulated towards the extremities. In the cuttings we observed fissures filled with crystals of ammoniacal salts: we found in these *huaneras* petrified eggs, feathers, bones, and even mummified birds.

### CONSTITUTION OF GUANO.

The first ideas on the nature of guano are

due to Fourcroy and Vauquelin. In a sample brought by Humboldt from the Isles of Chincha they found:—

1st. Uric acid, in part saturated with ammonia and lime

2nd. Oxalic acid, combined with ammonia and potash.

3rd. Phosphoric acid, united with the same basis and lime.

4th. Small quantities of sulphate of potash, chloride of potassium, and chloride of ammonia.

5th. A little quantity of fatty matter.

6th. Sand, in part quartzose, part ferruginous.

The composition of the ammoniacal guano was definitively fixed. They have since detected some weak portions of xanthine and guanine.

Of fifteen analyses made by Mr. Nisbet upon samples from the Chincha Isles, the composition of the guano was as follows:—

| | |
|---|---|
| Organic matters and ammoniacal salts | 52.52 |
| Phosphate of lime . . . . . | 19.52 |
| Phosphoric acid . . . . . | 3.12 |
| Alkaline salts, &c. . . . . | 7.56 |
| Silica and sand . . . . . | 1.16 |
| Water . . . . . | 15.82 |
| | 100.00 |
| Soluble phosphate of lime . . | 6.76 |
| Insoluble do. . . . . | 19.52 |
| Total phosphates | 26.28 |
| Nitrogen . . . . . | 14.20 |
| (Answering to ammonia . . . | 17.32) |

The character of the guanos brought from a distance from the coast of Peru is—great richness in phosphate and the almost complete absence of azotous matters. These guanos, whatever may be said in their favour, are known not to possess the qualities, and consequently not the value of an ammoniacal guano, in which there enters, independent of the phosphoric acid, azote immediately assimilable by plants. I do not, in the meanwhile, deny their fertilizing properties. I believe also that it would be easy to render them *ammoniacal*, in putting to profit the properties they possess, when they are dry and in powder, by absorbing from 0.10 to 0.15 of aqueous solutions of sulphate of ammonia, or of nitrate of soda, incessantly, to be pulverulent.

It appears also evident that the earthy guanos and the ammoniacal guanos have all the same origin—the dejections and remains of sea birds. The disappearance of the ammonia in the first is due, probably, to local circumstances, such as the abundance and frequency of rains, which naturally favor the decomposition of organic substances, or the dissolution of salts with an ammoniacal base.

That part of the coast of the South Sea where the ammoniacal guano is deposited, presents, in fact this peculiarity—that upon a considerable extent, from *Tumbez* to the desert of *Atacama*, rain is, we may say, unknown; whilst beyond those limits, to the north of Tumbez, i the impenetrable forests and marshes of Choc it rains almost without ceasing. At Payta, si uated to the south of that province, when I w there, it had been seventeen years without rai At Chopcope (lat. 7 deg. 46 m. S.) it was note as a memorable event that it rained in 172 It is true it lasted forty nights, but ceased durin the day.

The rarity of rain in those countries is attr buted to the permanence and intensity of the S S.E. winds. It is in May and June that the bl w with the greatest force: the sky is then admirable clearness. The temperature is lowe ed by the effects of these currents of air, comin from those austral polar regions, which an nounce the end of summer (*verona*). There i no storm on this Peruvian coast. An inhabitan of Piura or Sechura, if he has not travelled, ha no idea of thunder. Yet we should singularly deceive ourselves if we imagined that drought is permanent upon the coast. For many months the earth is watered without rain, and the valleys and hills are clothed with verdure; it is then that a period arrives in which the wind from the austral region is replaced by one from the north, scarcely perceptible—so weak, that it has just force enough to move a weathercock, or to agitate the sails of the ships; it is a slight movement of the air—an indecisive calm, indicating that the S. S. E. breeze has ceased. After this change, from July to November the atmosphere assumes quite a different aspect. The wind in assuming by degrees the S.S.E. normal direction, slowly modifies itself. It is then winter (*invierno*). The bright light with which the country was inundated is succeeded by a half-day, which oppresses the spirits; the heaven is veiled with a thick fog, and it is but rarely, during a few bright moments, that we perceive the sun. Regularly between ten o'clock and noon, vesicular vapour rises, and is suspended at a certain height, when it becomes a cloud. During the movement a part of the fog turns into drizzle (*garua*), which moistens the earth in the manner of dew. The *garuas* (that is the Indian term) are never abundant enough to make the roads impracticable, or in the slightest degree to penetrate the clothes; but by their persistence they introduce into the soil enough water to render it fertile, and maintain it in a condition of convenient moistness, when the south wind resuming its impetuosity, drives them away and prevents their appearance. Besides, upon those points, fortunately numerous enough on the coast, the aridity is only on the surface; at a certain depth we meet with a watery sheet, the origin of which is in the Cordcrillas. The pluvial waters received by the mountains of the Andes unless they are extremely abundant, do not always reach the sea. During a course of twenty or thirty leagues they are absorbed by the sand, and as this takes place at Piura and

Sechura, to find them we must dig the bed of the dried up torrents. It is at once to this absorption of an arenaceous soil, and to the frequency of the drizzling rain or *guaruas*, that the country comprehended between Tumbez and Chili owes its not being a desert throughout its whole extent.

It is exactly in this zone, where rain is sufficiently rare to be considered an event, between Payta and the Rio Loa, that the beds of ammoniacal guano are situated. Below, more to the north, as also more to the south of these extreme points, the guano, exposed to the tropical rains, is generally deprived of ammonia and soluble salts; an insoluable salt has resisted; this is phosphate of lime, the base and characteristic of earthy guano.

For guano to have been accumulated in sufficiently large quantities in the *huaneras*, it requires a concurrence of circumstances favourable alike to its production and preservation—a climate of unusual dryness, under which the birds have not to screen themselves from rain, in which terrestrial accidents offer crevasses and rents in which they can repose, lay, and hatch, sheltered from the strong gales of the south; in short finding food such as they find in the waters of the coast. In no part of the world is fish more abundant. It sometimes happens during the night, as I have myself witnessed, that they come stranded alive upon the beach in prodigious numbers, without the sea being agitated, as if they wished to escape from the pursuit of the enemy.

One of the Spanish navigators who accompanied the French academicians to the equator, Antonio de Ulloa, relates that the anchovy is in such abundance on that coast, that there are no figures to express or represent the quantity. It suffices to say that they serve for food to an immense number of birds, which make war upon them. These birds are commonly called *guanos*, among which are many albatrosses, a species of cormorant; but all are comprised under the general name of guanos. Sometimes, in rising on these isles, they form a cloud which obscures the sun. They take an hour and half or two hours in passing from one place to another, without any perceptible dimmution of their numbers. They extend themselves above the sea, and occupy a large space, after which they begin their fishing in a very amusing manner; for, suspending themselves in the air, and whirling round at a height proportioned to their sight immediately they perceive a fish they soar higher, head downwards, and then clasping their wing to their bodies, they strike with so much force, that we perceive the bubbling of the water at a great distance. Afterwards they resume their flight, while swallowing the fish. Sometimes they remain a long time under water, and emerge far from the place where they had plunged in, doubtless because the fish made an effort to escape, and they pursued it, disputing with it the lightness in swimming. Thus we see them incessantly in the places frequented by them, some falling into the water, others rising from it, and as the number is very great, it is amusing to see their confusion. When they are satisfied they repose upon the waves; they go to rest with the sun, collect together, and all this numerous band seek their resting place. We have observed at Callao that the birds who visit the isles and islets situated to the north of that port go at early morn to fish on the southern coast, and return in the evening to the places from whence they came. When they cross the port, one can see neither the beginning nor the end of the flight.

*To be continued in our next.*

## Good Cultivation v. Bad Cultivation, from a Chemical Point of View.

There is a difference between good and bad management in farming, that is not so easily accounted for as practical agriculturists are sometimes led to imagine. This is no less true in the cultivation of land than in the rearing and fattening of cattle. In either department of the farm it is common to attribute success to skill and capital, and the reverse to the contrary. But we all know that it is neither skill nor capital that makes corn and cattle grow. These are but means to certain ends, and when we come to inquire what those ends are, we often find ourselves beyond our depth in an unfathomable sea of troubles, doubts, and perplexities.

Let us confine our observations on the present occasion to land. A march fence runs up between two farms; geologically there is no difference between the soil and subsoil on the one side and the other, but there is a wide difference between their agricultural conditions as to fertility, and the amount of produce they respectively yield. In short, the one is "farmed with skill and capital," and the other is not, and such is considered quite sufficient to account for all differences. But to understand what "farmed with skill and capital" really means in every individual sense, and also the adverse management, the practical farmers require to see the land itself and the crops it yields. With them "seeing is believing;" for in the absence of ocular demonstration, such expressions have little more than the shadow of a meaning relative to what they are intended to convey. The land speaks for itself; so do the crops produced by it, and practical agriculturists are familiar with the language of both, although they may not be able to give a proper account of all that they see.

The difficulty experienced amongst practical men, it will thus be seen, is to give a scientific exposition of the facts of the case in the two systems of management, good and bad, under

notice. They see that a certain routine of drainage, cultivation, manuring, seeding, hoeing, and so forth, has produced certain favorable results in the one case, and unfavorable in the other; but when we enter further upon the inquiry as to the details of the several operations, and how such results are chemically and mechanically produced, they are lost in a labyrinth of surmisings, from which there is no clue to lead them outwards into the daylight of science. Many discoveries have to be made before it can be said we even know anything as we ought to know relative to the chemistry and mechanics of the soil, and of the crops it yields.

This may be humbling, but it is a plain matter of fact, and the sooner we, as agriculturists, admit the existence of a great blank here in the science of our profession, the sooner and more likely are we to set out in search of the practical information we stand so much in need of in both cases. "Knowledge is power;" and there cannot be a doubt, that if we properly understand how certain fertilizing results were produced, it would enable us to pursue a much more economical and profitable system of husbandry than we now do—even the most successful in the field. From time immemorial the experienced and skilful cultivator has been familiar with a certain healthy condition of the land necessary to obtain a bountiful harvest; but in how many cases has this success been attributed to "his own good luck," or personal labours, instead of to certain mechanical and hygrometrical conditions of the soil necessary to produce certain chemical and fertilizing results? However absolutely expedient it may be to apply certain quantities of manure to land, yet all who have any experience in manuring are well aware that it is not manure alone that produces crops of green forage, much less a plentiful return of bread corn, for the bad farmer often applies more manure than the good, while he fails to reap a half, or, it may be, a third of the quantity of produce, and that quantity, too, of an inferior quality. Indeed, it may be accepted as an established axiom in farming, that cultivation, including drainage, has more to do with the growth of corn than farm-yard manure, or any of the artificial manures now applied to land.

The reader is not to conclude, from these generalizing remarks, that we are under-estimating the value of manure. On the contrary, the most fertile lands under aration require repeated doses of manure to maintain them in this condition. In point of fact, manure is but another name for the food of plants; and as upwards of 70 per cent. of the weight of growing crops is water, it consequently follows that it is the most important constituent of manure. Next to water, the organic elements of plants occupy the most prominent place, the quantity of mineral food consumed being small. But when we enter the field, and begin to inquire into the resources from whence plants derive their food, we find that they obtain a large supply from the atmosphere, and also that heat, light, and certain electrical conditions are all essential necessary to their healthy vitality. We find much more than this: for the soil is full of decaying vegetable matter, the roots of the previous crops: so that the further they ramify throughout a well-pulverized soil, the greater the quantity of manure from this source. Next we have an important supply of animal matter from insects and the feces of our domesticated animals. Then we have three different kinds of decomposition, besides certain laws of chemical ecorom to attend to; and when we have examined all these under the very dim, shadowy, and imperfect light of science in which they are now seen, we can experience but very little difficulty in perceiving how important is the function of cultivation and natural fertilization, so to speak, when compared with that of manure artificially applied.

As we thus advance in the investigation of our subject, we begin to see its length and breadth. Although we cannot perceive with the naked eye all the chemical phenomena that are taking place below the surface of the soil, we can nevertheless see enough to account for the success of the good farmer and the comparative failure of the bad. We can observe, for example, three different kinds of chemical change in the breaking up of animal, vegetable, and mineral substances to their original or new constituents—a mean, and two extremes, as it were. In the mean—the well-cultivated field—the highest degree of economy is not only preserved, but a much larger amount of fertilizing element is derived from the weather or moisture and atmosphere of the soil, in combination with mineral matters, than is indicated by the amount of manure artificially applied. In the one extreme there is an excess of water, the lands being imperfectly drained and aerated; consequently we have hydro-decomposition—nay, malaria—with all the "will o'-the-wisp" phenomena so adverse to the health of cultivated crops. And in the other extreme we have eremeausis, or the food plants dissipated in the atmosphere in the form of gases, the soil being thus left in a comparatively barren and unproductive state.

In applying these several data first to the land farmed with skill and capital, we have to observe that the staple or soil under the immediate action of the plough has a greater affinity for water than the staple of badly-farmed fields—that it obtains a much larger benefit from night dews—that it contains in its pores a much larger quantity of water for supplying the crop from summer showers; consequently, from these and other data, it suffers less harm from eremeausis in times of drought. There is, it must also be observed, a wide difference between different kinds of soils in these several respects, but

in every case there is a common principle exemplified, one which is very observable in more ways than one: for the crops grow faster and heavier, thus extracting a much larger quantity of water from the soil, while the soil nevertheless continues to contain more water.

This greater affinity for water is partly accounted for by the soil containing a larger percentage of decaying vegetable and mineral matters, and partly from its mechanical sub-division; while these differences give rise to others, relative to temperature, electricity, aeration, &c. that must of necessity affect the chemical phenomena that take place in the soil. It is a well-known fact that decaying vegetable matter—such as the roots of plants, when they undergo what may be termed a healthy state of decomposition the process being attended with the proper supply of air and moisture—have a great affinity for water, drinking it up and retaining it in its pores like a sponge; and that the soil, when in a certain state of pulverization, also holds more water, on the same principle, than when it is otherwise cultivated.

Of the chemical changes that take place in the fertilization of the soil, as when it is under a naked fallow, and of the products formed which constitute the food of growing crops, very little is yet known that can be relied upon as matter of established fact. That the process in the case of fallow, or land without a crop, is different from the process that takes place in the formation of food for growing plants, is more than probable; and that the several processes must differ widely from each other in their chemical characters in different kinds of soil, in different climates, and in different temperatures, is equally manifest. Indeed, the different species of plants that spring up naturally under such a diversity of circumstances may be accepted as practical evidence in support of these conclusions. Moreover it naturally follows as a corollary, that the fertilization of different kinds of land for the growth of any individual crop, or the enriching of any one quality of soil for the growth of different kinds of plants, involves just as many chemical processes. But, although general conclusions of this kind may be safely drawn, from their having the sanction of practical illustration, yet of the innumerable chemical details which they must of necessity involve in the soil, as a laboratory, nothing is definitely known, comparatively speaking.

The facts just noticed require a twofold illustration, thus: In the popular phraseology of the farm, we limit fertility to that condition of the soil conducive to the growth of wheat, barley and the other cultivated crops. We cultivate the land for the production of these crops, and, consequently adopt those means calculated to supply them with the food which they respectively require. Hence the familiar doctrine of different kinds of manure for different kinds of crops—one kind to wheat, for example and another to turnips, &c.

This limited sense, however, of the expression "fertility," is not altogether a correct one, when practically examined at the bar of experience, either according to the current testimony of things, or in the more definite language of science. Thus the soil of the good farmer is rich for the produce of corn and turnips: that of the bad farmer is rich for the growth of weeds. The former is the more fertile soil of the two for the growth of corn and turnips; the latter the more fertile of the two for the growth of a different class of plants, yclept "weeds" In the one case, the manure undergoes certain chemical changes, to prepare it for the peculiar vegetable organization exemplified in wheat, &c; but in the other case, it passes through a very different process, in the laboratory of the soil before it appears in the form of weeds.

The soil is thus a laboratory in both cases, exemplifying not only the apparatus of Nature—whom we may here compare to a working chemist—but the raw materials, agents, &c, used in the process of enriching the land, and and feeding our crops with the food they require. It is when we thus enter Nature's workshop, so to speak, that we lose ourselves in the mysteries of her handicraft, being unable as yet to follow her throughout her various manipulations. Discoveries are much wanted in this department of chemical science; and from the peculiar character of the processes, as regards the preparation of the raw materials, their organization, and the agents necessary, in both cases the most persevering research will be found necessary to obtain success.

One fatal mistake, or fallacious course, we must guard the reader against; and that is, to trust too much to the laboratories of our agricultural chemists, as affording a faithful reading of Nature's chemistry in the soil, and the vegetable economy of plants; for the discoveries above referred to have first to be made, before they can be explicitly relied upon. But to this we shall return, when we have examined the other two cases formerly designated the two extremes —*land containing too much water, and land deficient of water.*

The former of these involves the chemistry of manure in undrained lands, or the decomposition of animal, vegetable, and mineral matters in a soil where the atmosphere is excluded, by its pores being filled with water. Bogs, swamps, and marshy lands are familiar examples of this kind, as are also badly-drained and ill-cultivated clay soil, in wet seasons. From time immemorial, it has been a by-word amongst farmers—"Just as well throw the manure into the river, as place it in such lands." That this old saying involves a most important chemical truth, is fully borne out by the experience of all who have manured such soils. It, therefore, only

remains to account for such unprofitable results.

But, before this can be done satisfactorily, many discoveries have to be made in this case, as in the last; and to these we shall return.

Our next topic—the other extreme—is, wasting our manure by *eremacausis*. When the soil burns up, during summer, the products of combustion of animal, vegetable, and mineral matters, more especially of the two former, are dissipated in the atmosphere, in the form of gases. Some subsoils are said to "drink in all the rain, and eat up all the manure," thus leaving nothing to support vegetation. Such is the chemical language of practical men; and of the truthfulness of its meaning there cannot be a doubt raised. In Africa and Asia, vast regions of what were once fertile productive lands, are now drifting, sandy deserts, through the instrumentality of this most ruinous process—*eremacausis*. Nor is its wasteful agency confined to those unfortunate regions; for in dry seasons, and, indeed, during summer generally, there is a very heavy loss sustained in this country by it. Thus, whenever crops begin to suffer from drought, and the land to "burn up," then the wasting process of *eremacausis* commences. The organic matters of the soil then begin to decompose, their constituent elements being given off into the atmosphere in a gaseous form. From the shortness of our summers, the general moistness of the climate, and the early rains of autumn, the parching work of devastation is arrested, but not before much harm is often done, not only to the crops on the land at the time, but also, prospectively, to subsequent crops.

The manure, in short, has been wasted—both that which is naturally in the soil, such as the decaying roots of plants, and that which was artificially applied.

We now come, as formerly promised, to offer a few remarks in reference to each of these examples or processes of decomposition, partly to show their application in practice, and partly to stimulate discovery in the research of those important truths in chemical science that evidently lie hidden at no very great depth, some of them, below the surface. The question is a comparative one—to choose the good and avoid the bad We want to avoid the two extremes—the wasting of our manure by hydro-decomposition and eremacausis, and to adopt the means for our general practice when decomposition is accompanied with a suitable supply of air and water in the soil. In this case oxygen is derived both from the water and the air to support combustion, so that the hydrogen of the former and the nitrogen of the latter are thus liberated—not however in a free state when the process is properly performed, but in combination with other elements in such a manner that they unite in forming ammoniacal compounds of a highly fertilizing quality. We have long advocated the doctrine which this conclusion involves as being imperatively necessary to account for the enriching results of good cultivation and the heavy crops grown under good farming, and which up to this date have not otherwise been satisfactorily accounted for. No doubt we have "the clouds" from whence some theoretical chemists have drawn a plentiful supply of ammonia, nitric acid, &c., to account for all deficiencies in the soil? But, unfortunately for this doctrine, on applying water artificially to the land, and under a clear cloudless sky, we find the evidence of an abundance of fertilizing ammoniacal matter thus evidently created somehow or other in the soil. If some plants exhale ammonia from their leaves, thus evidently manufacturing it within their system, why should the manufacture of ammonia in the soil, under special and even more favorable circumstances, be thought incredible? And if this is true, as we believe it is, and as results prove indirectly, why should we not endeavor to discover those peculiar conditions of the soil, the laboratory apparatus and re-agents of Nature necessary to the fertilization of our lands on so favorable terms? If practical chemists can manufacture certain ammoniacal products in their laboratories on the scientific principle, and if our best practical agriculturists can do the same in the soil by specific cultivation, why should not agricultural chemistry "stir up her nest," if we may be permitted to use the well-known simile, and discover the *scientific rationale* of so important a practical result! To us the principle appears as clear as the light of day; but the practical exposition of that principle being matter of fact—certain proximate principles which in all probability are different in different qualities of soils—they as a matter of course fail to be discovered and identified in every individual case what they are and what are their ultimate principles. There is here obviously a blank in chemical science that requires to be filled up in order that the great body of agriculturists may profit by its reduction to practice. The two extremes which we wish to avoid corroborate in some measure the conclusion at which we have just arrived; for, in hydro-decomposition, in the case of undrained lands, the oxygen that supports combustion is almost exclusively derived from the water, so that a large amount of hydrogen is liberated. Now, this hydrogen is found in the form of sulphuretted hydrogen gas, carburetted hydrogen gas, phosphuretted hydrogen gas, and so on, according to the special circumstances of the case. Again, in the other extreme—eremacausis—there is no water, and consequently no hydrogen set free. In this the oxygen that supports combustion is derived almost exclusively from the atmosphere of the soil, and consequently an excess of nitrogen liberated, but not in a form to be of any benefit to the land. There is now a tendency to an ultimate analysis instead of the formation of proximate principles for vegetable organiza-

tion—a chemical change diametrically opposite to that which we wish to reduce to practice. Thus in the one extreme, that which we have last noticed, viz, eremacausie, the oxygen consumed in the process of combustion or decomposition is derived from the atmosphere; in the other extreme hydro decomposition is derived from the water which undrained land contains in excess, to the exclusion of air; but in the mean, which we wish to carry out into practice, it is derived from both the water and the air, and under circumstances to economise the liberated elements of ammonia. The former two, the extremes, illustrate the chemistry of the bad farmer; the mean, that of the good.—*Mark Lane Express.*

## Colonial Wheat.

(*From the Mark Lane Express.*)

The British colonies are so numerous and so widely spread over the globe, that collective information, illustrated by specimens of their agricultural productions, will be of great interest. We often meet, for instance, with exaggerated statements, and exceptional instances of the productiveness of the Australian colonies, which are to be regretted. Thus Dr. Lang, an over-zealous colonist, is said, not long since to have met the lie direct from a Suffolk farmer, for stating that land in the Clarence and Richmond districts of New South Wales would produce 80 bushels to the acre. This is of course absurd, although large occasional growths have been made. On the table land at Argyle, at Bringle, the Kurrajong, and other favoured spots in the colony, 40 bushels, and even more of the best wheat have been grown. This, however, is not common. In New South Wales farming is more slovenly than in any of the adjoining colonies, but yet it has the largest average production. In South Australia, where the most attention is paid to it, the average is the lowest. The general average for New South Wales would appear to be about 15½ bushels to the acre. In the county of Cumberland alone it is 16½ bushels. In Victoria, the average production is 15 bushels; in Tasmania 14, in South Australia 12, and in the United States 13 bushels. The wheat of South Australia and Tasmania is generally best in quality, and commands the highest price. A sample of Menangle wheat from New South Wales took the great prize at the Paris exhibition. The heaviest wheat for show was that of Mr. Shaw, Canada, which weighed nearly 83 kilogrammes (182 lbs.) the hectolitre 2¾ bushels. The handsomest sample of wheat was from the Cape Colony, of large grain, regular form, and slightly elongated, and as white in colour as bleached wax, and weighed about 81 kilogrammes the hectolitre. The wheat exhibited by Mr. Gibson, of Tasmania, Mr. H. Gumfletor, of New South Wales, and Mr. Barker, of Victoria, resembled this closely, but was inferior in colour. A wheat shown by Mr. Gibson, weighed 82¾ kilos., one by Mr. McArthur 83 1-3rd kilos., and that of Mr. Barker 80 kilos. All these received first-class medals, as did a white spring wheat, shown by the Canada Company. Three other exhibitors from Tasmania received second-class medals for wheat. The Australian wheats, exhibited in 1855, were nevertheless inferior to the fine wheat shown in Hyde Park in 1851, from South Australia. It does not appear, however, that those fine grains, sown in this country, retain the excellence of their original type. In the words of Mr. Denison, grains matured under a hot sun form, according to the commonly received opinion, the most valuable seed; but in the case of wheat, the practice seems to be the the reverse of this. It is certain that our strong and prolific wheats are imported into France for seed. These strong and coarse wheats, no doubt, refine in colour and in quality under a more southern sun. It does not appear that the exchange of the grains of the south to our northern latitudes is attended with results equally advantageous. It would be desirable that some careful experiments should be made to induce to greater certainty on this point of so much interest.

## To Keep Potatoes. Bury them.

Sir,—Your notices of the conservative principle in seeds buried at a depth beyond the action of air and moisture brings to my recollection a case of potatoes being buried for two years, six feet under the surface, at the end of which time they were taken up quite sound and good for use. The case I refer to was the result of accident, and happened thus. I had an old ice-well of the ordinary description, which I abandoned when I built one constructed of double timbers on the surface, after the American fashion. My gardener used, for several years, the old well as a potatoe-store. It happened three years ago that the roof fell in and buried several hundredweights of potatoes, which as we had plenty was not cared for at the time. Last year we required stones, and had those forming the sides and roof of the old ice-house dug out when to our astonishment we found almost the whole of the potatoes as sound as those of the same year's crop. I mention this as it may be turned to account in seasons when we have, as we had last year, a surplus crop, that by burying them deep enough, and in a dry place, we might secure ourselves against a short crop, as in all probability will be the case this year on account of the prevailing disease. In mentioning this to a friend learned in such matters, he tells me that potatoes buried one foot deep produce shoots near the end of spring; at the depth of two feet they appear about the middle of summer; at three feet in

depth they appear very short and never come to the surface; and between three and five feet they cease to vegetate. He further informs me that he has buried potatoes in his garden at the depth of three and a half feet, which were not removed until after one or two years, when they were found quite sound and possessed their original freshness, firmness, goodness, and taste.—I am &c., W. G. JOHNSTONE.—*Scottish Farmer.*

## Scour amongst Lambs.

Hundreds of lambs are now dying every week in the midland and western districts of England from debilitating diarrhœa, produced by the accumulation in the bowels of myriads of minute thread like worms, similar to those which at this season of the year infest the air passages of young calves, and produce the disease commonly known in Scotland as "hoose." It is not confined, as is frequently the case, to localities sheltered by trees or by numerous and overgrown hedges. It has appeared on the usually healthy clovers of the Cotswold hills, as well as in the lower meadow lands. One eminent Cotswold breeder has lost since the month began fifty of his lambs, or more than half of those affected. Another large breeder and buyer has lost nearly a hundred; and both of these gentlemen have good sound land, on which lambs thrive remarkably well. Thin looking and dull, with a dry unthrifty coat, the sheep lags behind its fellows, pays frequent visits to the watering place, has usually a short choking cough, and to use the shepherd's homely phrase, "it runs out." The common nostrums used in such circumstances are sometimes resorted to, but seldom with much effect; the diarrhœa continues, the strength fails, and the animal seldom survives a week, and often dies in half that time. If the animal be opened, the thread like worms referred to will be found amid thick unhealthy mucous, aggregated in little masses, and distributed especially throughout the small intestines. Notwithstanding the popular idea to the contrary, there is seldom any appearance of inflammation, and the stomachs and bowels as might be expected, are nearly empty. Filaria are also frequently found on the bronchial tubes and lungs, accounting for the cough and breathlessness which so generally accompany the scouring. It should be recollected that these filaria, whether in the digestive or respiratory organs, must be looked for within a few hours after death; for if the search of them be longer deferred, they are distinguishable with more difficulty, and by-and-by appear to be broken up and lost amongst the thickened mucous. In spite of the losses which generally attend the disease, it is easily curable in its earlier stages by any of those remedies which kill the worms. For this end few things answer better than a teaspoonful of oil of turpentine, given with a little oil, and repeated daily, or every second day. Three or four doses generally effect a cure. "What," we have repeatedly been asked, "won't the physic increase the scouring? Shouldn't laudanum, oak bark, or other astringents be used to staunch the running?" This is the treatment often pursued by those unacquainted with the nature of such complaints. They forget that diarrhœa, in the first instance, usually depends on the presence of some irritant matters in the alimentary canal, and is induced by a natural effort to carry them away. Thus misinterpreting the case, and ignoring the conditions on which it depends, they vainly endeavour to restore health by at once arresting the discharge. Greatly more rational and effective is the administration of a properly regulated dose of physic which removes the irritant, and thus allows the bowels to resume their natural state. A like principle is applicable in the case of these filaria. They are poisoned by the turpentine, and effectually removed by the laxative with which it is united. It is perfectly unnecessay to give the medicine, as if often done, by the nostrils. There is thus great risk of choking the struggling patient, whilst the draught, whether given by the nose or mouth, finds its way into the stomach and bowels, where its pungent penetrating quality will carry prompt destruction to the parasites. In certain seasons and localities this complaint attacks calves as well as lambs, and occasionally proves troublesome and even fatal. More frequently, however, the filaria accumulate in the air passages, producing the familiar hoose, which of various degrees of severity occurs during the autumn months. The treatment is exactly the same as that just advised for lambs. The dose for a six months' calf may consist of a tablespoonful of oil of turpentine and three ounces of linseed or castor oil. The medicine should be given by the mouth after several hours' fasting. In the large majority of cases, the unthrifty appearance, slight cough and disordered bowels which are so prevalent amongst calves during autumn, depend on those troublesome filaria, and are easily remedied by the timeous use of a few doses of the turpentine and oil. Attention must also be paid to general comfort—to the supplying of good food, affording proper shelter in the cold, frosty nights, and avoiding over-crowding.—*North British Agriculturist.*

## The Potato Disease.

This mysterious scourge is again manifesting itself on this continent, and in many parts of Canada the potato crop, which has only been just raised, is rapidly decaying. We learn that such is also the case in several parts of Europe including Great Britain, while in Ireland where unfortunately potato culture has of late been

very much extended, the disease had assumed the most malignant form.

The following remarks from the *Scottish Farmer* relative to the disease and storing of the Potato will be found interesting:

"The long-continued wet and broken weather has already destroyed a large portion of the potato crop, and that portion which yet remains sound will require every precaution in lifting and storing it for the winter. The sound potatoes are at present in a highly delicate condition, and very susceptible of any influence which tends to promote putrefactive fermentation. In gardens, even where the crop is mostly sound, it is found that the tubers are softer and more water than they were a month ago. This in many cases has proved the precursor of rapidly-spreading disease, yet roots in this condition stand a better chance of remaining sound in the ground than in any way which it is possible to store them. Before the appearance of the disease in 1845 it was quite common to store potatoes in large masses in houses. The roots would often keep quite sound in this state through the greater part of the winter. No fermentation was induced, and any little heat generated had the effect or causing the roots to sprout. Since that time, however, things have been entirely changed. In 1845 the larger portion of the crop was taken up to all appearances quite sound; but wherever it was stored in large pits or in houses a destructive fermentation was induced, which speedily reduced the roots to a rotten mass. As is well known, the warm and rainy weather of 1846 gave rise to the most virulent which disease has ever assumed in this country. It was only a small portion of the crop that was worth the lifting. The drier seasons that followed seemed to have the effect of warding off the disease to a greater or less extent in certain districts. In Scotland, too, as a general rule, the malady has not been anything so severe as it has been in England. This may be mostly ascribed to the lower temperature and to the less frequent electric explosions in the north. It has been long observed that thunderstorms seem to stimulate the latent seeds of the disease, and promote first the destruction of the haulm and then that of the tubers. Thunderstorms have been pretty geeral over Scotland this season, but it may be remarked that those localities which escaped them are at present far from free from the ravages of the disease.

It has been found that putting together potatoes in large quantities has often had the effect of spreading the taint through the whole. For this reason it is seldom that they are now stored in houses. The small the quantities that can be put together the better, as it will diminish the risk of their spoiling. The narrower therefore that the pits are made, so much the more chance is there of the roots keeping through the winter, and not sprouting prematurely in spring.

It is far from advisable to begin to store before the weather becomes somewhat cool, as heat is very apt to spread the destructive taint. The mere handling of the potatoes, too, before the crop is ripened, and especially in the condition it is at present, excites the dormant or undeveloped stages of the disease; and hence the rapid course which we already read of its running in roots that have been recently lifted. A good many, seeing the stems totally destroyed, imagine that the crop is fully ripe, and may be stored when the weather is favourable. This, however, is a highly dangerous practice, and it is better to wait till the browning weather of October shall have so far dried the soil and ripened or hardened the roots.

Dry weather in the latter part of October is much to be desired; for unless the crop is stored free from wet, there will be more or less decay in the pits. The sound and the diseased roots can never be better separated than when the crop is ploughed up. They are far more easily distinguished at that time, and the unsound roots can be consumed on the farm or sent to the farina mills. Turning over and picking out the diseased in the pits is both an expensive and unsatisfactory process, as it rather encourages the progress of decay among those roots that are sound.

Mr. Mathews, under date of October 7th, in his report on the crops of the Carse of Gowrie, Scotland, for the *Mark Lane Express*, speaks of Turnips and potatoes, as follows:—

The turnips, upon which so much depends, not only of our meat supply, but also of our manure for another season, are generally excellent, except in some cases where "fingers-and-toes" has prevailed. This disease, dangerously on the increase, is apparently due to two causes—the direct, and the probably indirect; the direct, a continuation and increase of the destroying insect, in consequence of the extended culture of the turnip (destroyers, as a general law of Nature, have powers of increase greater than the organisms they destroy, when these organisms become much extended, in order, apparently, to act as a balance, to prevent the unnaturally-great extensions of any particular family of organic life); the probably indirect, a consequence of the turnips becoming more liable to insect disease from some constitutional defect, the result of the ground having been soo much of late under turnips.

From the late showery wheather in England the turnips on the eastern and lower portion of that country, which from the great drought had been stunted and a good deal affected with the white mildew or blight, have improved considerably, while in the higher nothern and western portion of England, where the climate is naturally moist and better suited for the growth of this

root, they are as good as in Scotland. This must serve to prevent any further decline in the value of cattle during the winter, though it may lower them a little towards spring. Much, however, of the value of turnips depends upon the coming winter, and to make sure, wherever the turnips are well ripened and of large size, they ought to be removed and put in ridges similar to potatoes, and covered with plenty of straw, best wet straw, care being taken not to wound the bulb in cutting off the root or stem leaves, and especially not to cut these too close to the bulb, also not to bruise the bulb in any way. Some farmers empty down the turnips from the cop-cart in a flat heap of unlimited length and breadth, but not more than 2½ feet deep, giving a cover of straw to the whole, so as to protect against frost, the access of the rain through the straw being found rather beneficial, while the stray becoming wet by the first shower retains them by evaporation in a cool condition. The writer has sometimes emptied the carts into a ditch, filling it to the brim, and covering the top with straw, taking care to stalk the lower end of the ditch so as the turnips could not swim away. Here the small quantity of running water passing through the turnips seemed to be serviceable in preventing rot.

To turn to the vexed and vexatious potato question, we notice that in this district the earlier and moister situated fields are the most affected with rot in the tubers. That the earlier are the most so, seems owing to these having reached, during the wet weather of the month of July and first half of August, a stage of ripeness when the vitality becomes weaker, and less able to withstand the corrupting influences of moisture, heat, and loose electricity; whereas the later were at that time stronger in youthful vigour, so as to withstand these aids of corruption. After the season becomes colder, the rot makes slight progress even in the field; and provided the tubers, after being gathered, are not protected from the cold, or themselves become heated or such a quantity of the unsound left mixed with the sound in the ridge-bin as to act as a barm-ferment to forward the corruption of the whole mass, they remain pretty sound till spring. Hence the bin ought to be narrow, well ventilated, with perhaps a cover of wet straw only for a time—till the approach of frost; the straw so placed as not to communicate any moisture to the potatoes below, or allow any rain to penetrate. In potato fields that I have examined this season, I have found the weak and sickly from poverty of soil, and the over luxuriant from over-richness of soil, both more affected with the blight than where the soil was of a suitable richness for a fair crop. In all cases I found the moister the position, whether in regard to soil or atmosphere, the rot was the worse. Last season I put your reader in mind to take the newly taken-up potatoes showing spots of rot at once to the boiler, if there was not a demand at the starch mill or for feeding cattle; and after cooking, to store them in pits of the ground, for feeding pigs during the winter, where the sour like the sauer kraut of the German; and be much relished if mixed with any broken grain, especially rye.

Coolness, short of freezing and dryness, is the best means of repressing the progress of the potato rot. The farmer ought to know and never forget the effect of evaporation and of clear right radiation in producing cold. To convince him of the effect of evaporation, let him naked put on a wet shirt, and stand (not in the sun) in a strong current of air, in dryness above the dew point. The hoar-frost morning, not unfrequent in spring and autumn, and even in summer when the night is clear and still, though the previous day was warm sunshine, is an example to him of radiation producing cold. In India they dig shallow hollows about 18 inches deep and a few yards in breadth, fill these about one half with loose wet straw, and place shallow plates filled with water upon the wet straw; and in the morning, if the night was clear and still, the water in the plates is changed to ice, the joint effect of evaporation and radiation. Here the slight dug out hollow in which the evaporating straw is placed prevents the cooled air, however, than warmer air, from spreading along the surface of the ground; it remains in the slight hollow as water in a cup. The farmer ought also to know the different capacities of the same substance in the solid, liquid and gaseous form for heat; that two pots of equal size, the one filled with ice and the other with water, the ice and water both about the temperature of 32 degrees—that both being placed upon the same fire, the water will boil as soon or sooner than the other will be raised one degree in temperature, only melted; and again, that it will take more time, that is more heat, to boil off the water into steam, the gaseous form, than it did to melt the ice; or to raise the water from 32 degrees to 212 degrees, that is from the melting to the boiling point. It appears that all other substances, like water, have a solid, liquid and gaseous form.

## Horticultural.

### Culture of the Vine and Fruit Trees in Pots.

Mr. Editor.—A short time ago I observed in the *Journal of Horticulture*, London, England, from *The Boston Cultivator*, an article on the culture of the Vine in Pots. The writer very justly represents it as one of the most interesting, elegant and profitable branches of modern horticulture, when well understood and properly managed. He states, and I quite agree with him, that the culture of the vine in pots will be found as easy and simple as in a border, and better

ited to the circumstances and wants of the many. So sensibly aware am I of these facts, d of the many advantages that may be obtain- d by the adoption of such a mode, that I feel sured if some who have it in their power will y it, they will soon see the advantage, and be e to convince their neighbours of its utility, t only with the vine, but also with the peach, e nectarine, the fig, and all our finer fruits.

The system is largely and successfully practis- d in England, and to a certain extent in the nited States. It is strange that it is so little aught of in Canada. Our climate is good, there e many wealthy gentlemen amongst us, many od and willing gardeners, let us begin in earn- st,—we like good things as well as others, and hy not have them. Such a thing will be found th pleasant and profitable.

Mr. Murray of Messrs. Bruce & Murray, Rose- le Nursery in this city, in a paper on the rchard House read a few months past before e Horticultural Club here, afterwards publish- d in your Journal; remarked that he hoped be- re many years passed over our heads that all e wealthy portion of our community would re their Orchard Houses, and not only they, t every Farmer, Merchant, and Mechanic uld sit under his own vine and fig tree. ny I have no doubt would like to see this. would advise Messrs. Bruce & Murray, who have t their hand to the wheel, to forward the ex- ple. This they can easily do by fruiting next year's Provincial Exhibition, a few zen of the fine Pot-vines and Peach trees saw in passing through their nursery the her day, Might not the Society offer prize for such a thing, I am inclined to think would tend to much good. But to return to thread of my discourse; good orchard houses e absolutely necessary for success, and profit- le cultivation, but any one who has a vinery, een-house, or small pots, may grow a few nts and succeed very well. In Pot-culture uch may be done in a small way, in a pit or me erection under a few lights of glass. Some our hardiest hot-house vines will answer ry well with such treatment, there is no rea- by some of them might not be tried as Cot- ge Window plants. Both writers to whom I fer differ a little in their estimate of produce. my opinion neither oversteps the mark, the r states that from under 500 square feet of ss, by pot-culture 500 lbs. of grapes may be oduce; the other says for a young vine 5 lbs., grapes, and for peaches two dozen of good —the latter I consider as under. In my n experience I have known vines two years d produce ten and twelve lbs. of good fruit, d three years old peach trees four dozen of aches.

Yours, &c., HORTUS.

Hamilton, Oct. 30th, 1851.

P.S.—Remember John Frost's mischief last ter and protect all valuable young trees.

## Crystal Palace Gardens.

The terrace gardens and flower beds at this season of the year form one of the great attractions of the Crystal Palace. As the disposition of the flowering plants this season has excited unusual attention, it is anticipated that a short description of the various arrangements of the beds and parterres will be read with much interest. As is well known, there is a range of six fountains on the terrace at the Crystal Palace. These are surrounded with grass-plats, ornamented with hundreds of flower-beds. It is to these latter that attention is specially directed, and it may at once be stated that at no former period have they been more luxuriantly brilliant than at the present time, their appearance reflecting much credit upon the care bestowed upon them by Mr. Gordon, the Company' superintendent of the out-door gardens and park. The fountains nearest to the north and south wings are surrounded by rhododendron beds. The next pair of basins are encircled by chain beds of yellow calceolarias and scarlet geraniums, with margins of light variegated alyssum. The seven square beds of flowers forming the inner decorations of these clumps are made up with margins of blue lobelias and variegated leaf geranium, having in the centres purple petunias, orange tropæolums, yellow calceolarias, purple unique geraniums or intermediate stocks, yellow tropæolums, scarlet geraniums, or rose petunias—the whole presenting a most beautifully diversified appearance. The clumps around the central pair of fountains have each nearly forty beds, all in the most brilliant flowering order. Those around the auracarias have an inner and outer margin of white cerastrium, filled up with blue dwarf lobelia. The small standard acacias are encircled with beds of orange gazania splendens and tropæolum with variegated geraniums for edging. The long line of beds fronting the lower terraces produce, perhaps the most brilliant effect of all, having an outer broad margin of purple king verbenas, enclosing lines of christiana geraniums, with a centre of bright scarlet Crystal Palace geraniums. Looking along the length of the terrace, these present a superbly magnificent appearance. The intermediate beds around the pedestals of the marble vases and statutes are composed of geraniums of various foliage and colour. It would occupy far too much time and space to attempt a descriptionof the whole of the remaining flower-beds, but it would be a great omission not to notice the numerous parterres of regular and brilliant colour which line each side of the great walk leading to the central round basin. Disposed in straight lines, capable of being viewed from a slightly elevated position, they present the most charming contrast of colours. The margins are formed of variegated alyssum; with purple nosegay geraniums in the middle, they have cerise-unique geraniums on each side of them; these are again

bounded by two rows of purple king verbenas, having between them and the margins also tw rows of orange tropæolum. The intervenin circular beds have each in their centre a tall humea elegans, surrounded by various geraniums and blue lobelias. The numerous marble vas on the terraces are filled principally with scarl t geraniums, the slopes around and within the rosary being also brilliant with geraniums, calceolarias, verbenas, tropæolums, &c. This description may appear somewhat technical, but as at this season of the year much attention is bestowed on the decorations of gardens, it may not be without service to those who desire to cultivate the brilliant and beautiful effects of varied bower-beds to direct attention to those at Crystal Palace, which certainly at no former period were ever more deserving special notice.

## Plant Potting.

To grow plants well in pots is no mean criterion of the cultivator's skill. At the exhibitions of our leading horticultural societies, fine specimens of plant culture are brought forward, but in ordinary practice, well managed plants are the exception rather than the rule.

The soil for potting is an important matter in this connection. What is termed a turfy-loam, is the basis of all composts for growing plants. Turfy-loam is a soil formed of decomposed turves that have been procured from an old pasture field; these turves should be thrown into a heap and watered with water in which a portion of potash has been dissolved, if rapid decay of the fibre is important. It is not desirable to reduce the vegetation to the last degree of decomposition; the fibry matter which it contains is the main element of growth; so that active vegetation in the grasses being destroyed it is in fit condition for use.

In selecting these turves preference should be given to old grass lands that have for many years been undisturbed; the grass roots will have formed a thick mat of vegetable matter, three or four inches in thickness; it should not be cut deeper, and if it will bear to be thrown about without breaking, it will evidence a substance equal to the famed *peat* of European gardens. These turves are valuable just in proportion to the amount of fibrous matter they contain, and for all purposes of plant growing are superior to any combination of soils and manures that can be formed. Its open and porous character renders it capable of producing as well as absorbing a great amount of vegetable food. When water is given, it passes freely through the pores, retaining much moisture in suspension, lessens the repetition of the watering pot, and the nutritious elements are not leached out by constant watering. It is not well known that in a turfy-soil, such as the above, all kinds of green house plants can be grown to great perfection. Plants grown in it are characterized the deep green, healthy hue of their foliage, early and well-ripened wood, and a profusion large and highly colored flowers. This proce from the circumstance that there is no excess stimulus, at any period of the plant's grow hence its developement is regular—one of most important points in all kinds of cultu the plant is not excited into a luxuriant gro of branches and foliage when young, as quently occurs when the soil is rendered r with nitrogenous mixtures, which retards mat ation of the wood, induces disease, and is favorable to the production of flowers and fr

In preparing this soil for potting it should be broken up too finely, and by using such rectives as sand, charcoal, &c., it can be re lated to suit any description of plant Pla that are to remain for years without remov should be potted in a soil well supplied with th correctives, so that adhesion in the soil after vegetable matter has become decayed may, some extent, be prevented. Weak growing pla will also require more than those that are rol

The preparation of the pots as regards dra age is of much moment, and there is some versity of opinion as to the amount of drains materials necessary. Some writers assert th it is worse than useless to place an inch or t of drainage in the bottom of pots, as it allo the water to pass off too rapidly, and entails necessary labor in keeping a sufficiency moisture in the soil. At first view this reasoni appears plausible; it is, nevertheless, a fact th well-drained pots, and a porous soil, will cont a more uniform and lasting supply of moistu than when these conditions are reversed, becau air is thus enabled to penetrate and hold wa in suspension. It is an erroneous supposition perhaps too prevalent, that drainage in reali renders a soil dry, so far as a complete abstr tion of moisture is understood. Drains c carry away the water that is not retained by sorption, which otherwise would prove injuriou When pots are imperfectly drained, the s shrinks in drying, and leaves the side of the p and when water is afterwards applied, it ru do.n between the soil and the pot, witho penetrating to the roots of the plant. the other hand, when water is applied on surface of properly drained soil, it immediat percolates freely throughout the mass, and wh it has absorbed all that it will retain, the surp passes away by the drainage. Both science a practice confirm the fact, that good drainage the foundation for good cultivation.

The material most generally used for drainage is technically termed crocks, be pieces of broken pots that are otherwise usele Those who are so fortunate as to have no bro or cracked pots, will find a good substitute oyster shells and broken charcoal, bones, ston bricks, &c. The oyster shell is laid over bottom, and all the broken material laid ove

desired; a small piece of perforated zinc laid over the bottom hole is a good preventive against the ingress of worms; which are sometimes troublesome when the plants are set out of doors. The amount of drainage necessary will of course vary with the size of the pot, and it will also be governed by the kind of plant. An average depth of one, and a half inches to a six inch pot, will be sufficient for permanent plants.

Previous to removing a plant from one pot to another, the soil should be allowed to become rather dry, which facilitates the arranging of roots and handling of the plant. When the plant is turned out of the pot, and the roots appear thickly matted and interwoven, the old drainage should be carefully removed, and the roots gently disintegrated, so that they may be spread into the fresh soil; this treatment is more particularly applicable to Azaleas, Camelias, Primroses, and similar plants, that may not have been very recently disturbed. Young plants of soft, free-growth, as Fuchsias, Geraniums, Lantanas, &c., should be re-potted as soon as the roots reach the sides of the pots, or at least before they become numerous and spreading, so that the plant may receive no sudden check in its growth. Many plants are kept comparatively dormant in winter, and the old wood cut down in spring to encourage a new growth; of which are Roses, Fuchsias, Geraniums, Clerodendrons, &c. They require to be repotted as soon as growth commences, and doing so the old ball of soil around the roots should be completely broken up, and a few of the strongest roots pruned back, to admit of being placed in the same or in a smaller pot; by this means a plant may receive fresh soil periodically, without using pots disproportionately large as compared with the size of the plant.

Another point worthy of attention is to use the soil for potting rather dry, and press it firmly into the pot, more particularly if placing fresh soil around an old ball of earth, which unless very carefully packed, will allow a passage for water, without the roots dry. If nothing harder than the fingers is used, there will be little danger of pressing the soil too firmly, if all has been in proper condition.

After a plant has been re potted it should receive a good watering at once, and be placed in a moist atmosphere for a few days afterwards, until growth is again established.—*Farmer and Gardener.*

## Management of Orchards.

The following is from a premium essay on orchards, written by Dr. J. A. Kennicot for the Transactions of the Illinois State Agricultural Society. Though specially designed for a different section of the country, our readers will find many points of interest and value:—

*Cultivation.*—Fruit trees need as much cultivation as corn and potatoes, and should have it, not for one year or five, but forever, or as long as they pay for it in fruit. But the cultivation should not be continued too late in summer, lest a late and consequently immature growth of wood should ensue. This caution is especially called for in relation to all tender-wooded sorts, like the peach and pear. You can raise any kind of hoed crop you please, among fruit trees.—Beans, potatoes, vines, roots, &c., best, and corn good, when not shading the young trees so much.

Never "seed down" a young orchard. Never let one of the forage "grasses" get a foothold in it. It is next to impossible to keep down "blue grass," and "June grass," when once established in an old orchard. Red clover is sometimes admissible to check a too luxuriant wood growth in deep rich loam. "Small grains" *never.* A crop of rye, barley, oats or wheat, is worse than "fire-blight" and caterpillars among fruit trees.

A shallow-running corn-plough "cultivator," and four-tined fork or pronged hoe, and common hoe, are the implements of cultivation. Keep the spade out of the orchard, and the large plough too, after the trees begin to bear.

*Pruning.*—As a rule, orchard trees need "pruning" as usually practised, about as much as a cow's horns, or a horse's hoofs need cutting! Most of the shaping should be done in the nursery, or during the first three or four years; at and after planting, as the trees attain size and a good shape, the removal of dead or diseased wood, and dense, unfruitful spray is about all the "thinning out" ever called for. "Shortening in" is quite another thing. You practise this on peaches, for example, to prevent leafless limbs, and keep them within reach; and on pears for the same purpose and to get a good form. Interfering branches, too, may sometimes be treated as dead wood, if they can be spared.

To *increase wood,* prune, or "cut back," in autumn or early spring, during *dormancy* To *check* wood growth, and of course encourage a tendency to bear, pinch back or cut at midsummer. June and July are the best months for general pruning. Winter is always bad. *Autumn* is the time to prune grapes. Pruning is a surgical operation, and requires as much judgment, though not quite as much skill, perhaps, as animal surgery. Under some circumstances, a tree has less powers of resistance to amputations to man. And as the good surgeon deems a short limb better than none, a good orchardist should first see whether it is not better to save than to amputate—better to keep the pruning-knife in your pocket, as the surgeon leaves his amputating case at home till absolutely needed. But when necessary to cut—cut boldly and freely, and above all, promptly and well.

*Manuring.*—I have left this to the last, because it *is* the last thing to practise, except in rare instances, as driving sand, which may be

helped by clay, leached ashes and cow manure, and barren clay, seldom found, which, by thorough drainage and exposure to winter frosts by autumn ploughing, may be made good by early application of coarse stable or horse manure, peaty earth and like matters. Manuring, to sustain fruitfulness, is another thing, and is not much needed in most orchards west, till the trees have been years in bearing; and, as often given, at planting, it is a great damage, and sometimes death to fruit trees. When you manure bearing orchards, let it be in autumn: spread evenly, and plough under, lightly in spring; but be careful to place it where the roots are, not close to the stem, and avoid breaking roots when you plough.

Special manures are often of great moment, especially broken or dissolved bones, leached ashes, air-slaked lime, &c., &c.

## Transactions.

### The Provincial Exhibition,

*Held at London, September* 1861.

Reported by Mr. William O'Brien.

As the principal value of our Provincial Exhibitions is to be found in the means which they afford of testing the progress of the country in the various industrial pursuits which are there represented, the first consideration that naturally arises with regard to them may be thus expressed—How does the exhibition just concluded compare with those that have preceded it? In what respects does it surpass, and in what, if any, is it inferior? Another question, too, may be pertinently asked—Do the public at large continue to manifest by their attendance the same appreciation of the value of the exhibition, and the same interest in the progress of the different branches of agricultural and mechanical industry?

Correctly to answer the questions thus proposed, it is necessary to take a variety of circumstances into consideration. In the first place the locality of the exhibition will largely affect the number of exhibitors as well as of visitors. The latter of course will always depend to a great extent upon the means of access to, and the accommodation at, the place of exhibition. But with reference to the articles exhibited it will always be found that in one section of the country particular classes will attain a prominence which they will not reach elsewhere. No where, indeed, but in the old settled parts of the country are the more valuable and expensive breeds of cattle cultivated to any extent, or manufactures largely carried on, and therefore the further removed is the place of exhibition from the centres of population the fewer in number and less in value will be the articles exhibited. The quantity and quality of agricultural productions will also be much affected by the seasons, as well as, especially as regards fruits and vegetables, by the climate which prevails in the neighbourhood of the show. Low prices again, and depression in business affairs, will seriously operate against a large attendance, while on the other hand anything that gives additional interest to the occasion will as largely contribute to its success.

Now with reference to the exhibition of 1861 it will be found that so many adventitious circumstances of a depressing character have been combined that the success which actually did attend it is a very striking proof of the steady progress of the country in the main elements of agricultural prosperity. Much as our western friends may boast of the rapid growth of their portion of the Province it is evident that, with a few exceptions, the locality of the show was rather beyond the limits within which our principal breeders are to be found, and to this cause we presume that we must attribute the fact that Durham cattle did not, on this occasion, manifest their usual superiority over all other breeds, while on the other hand, the large exhibition of working cattle and grades gave evidence of a less advanced stage of agricultural progress. Then the display of grains, roots, vegetables and fruit was painfully deficient as compared with last year. This, however, must not be taken to argue that in these important respects there has been any falling off in our mode of cultivation. It is rather to be attributed to the fact that the present season has been as unfavourable for the production of these articles as the last was eminently the reverse. That the sample of wheat this year is in general far inferior to that of last year appears to be now admitted on all sides, but that so meagre a display would be made in other cereals certainly seems to argue a deficiency somewhere. With regard to fruit, locality as well as season combined to give the show at Hamilton a degree of pre-eminence very desirable under the circumstances, and it may possibly be years before we again see a combination equally happy. The same remark is perhaps applicable to a certain extent to the show of roots, which compared rea

unfavourably with that of last year; but still the County of Middlesex alone should have been able to make a better display.

So far as the interest taken by the public in the exhibition may be judged of by their attendance thereat there was certainly no reason to complain, especially when we consider the numbers that were brought together last year at Hamilton by the unusual eclat given to the occasion by the presence of His Royal Highness, the Prince of Wales. And yet there can be no doubt that this year the number of visitors would have been even much larger than it was had a more liberal scale of fare, been adopted by the railway companies. The reduction should have been at least one-half instead of one-fourth; and, considering how largely the companies are indebted to Provincial aid, on an occasion of this kind a little more liberality might have been expected as a matter of policy if not of self-interest.

But while thus pointing out the particulars in which, in an agricultural point of view, the only one in which it is our province to regard it, the last exhibition was deficient as compared with that of the previous year, it is but fair to mention those in which it equalled, if it did not surpass it. Of the large display of working oxen we have already spoken. Of Durhams, the display, as before remarked, was not so large as we should have expected; but, as to quality, it was excellent. Herefords, owing to Mr. Stone's late importations, were placed upon an entirely new footing. Ayrshires were better than we have ever seen them, both as regards number and quality. Galloways did not show any great improvement. But of Devons the show surpassed anything we have ever seen. This again was a good deal due to the locality, Mr. Locke, the principal exhibitor of this breed, residing near London. Mr. Locke and Mr. Pincombe, another breeder living in the same neighbourhood, brought seventy head upon the ground between them. The show of sheep was fully equal to any we have previously had, and in the short-woolled class perhaps better. The show of pigs was also unquestionably the best yet we have ever had, every variety being more fully represented than on any previous occasion.

The show of implements was also very good, evincing a steady improvement in that useful branch of mechanism.

Upon the whole, therefore, it may be concluded that, with the exceptions alluded to above, the agricultural portion of the show was superior to any which have preceded it, and that as those exceptions are owing in a great measure to circumstances beyond the control of the farmer, the Association have no reason to be dissatisfied with the result. That it should have compared favourably at all with last year is indeed almost more than we ventured to anticipate, considering the unusual efforts that were then made in consequence of the expected presence of the Prince of Wales, combined as those efforts fortunately were with the most bountiful season that we had known for years. One remark may here be appropriately made, viz: that in almost every class there was this year a very remarkable disproportion between the number of entries made, and the number of articles actually exhibited. Thus in grain the number of entries was nearly as great as that of last year, while the number of specimens chosen was less by one-half, and the same thing, though to a less extent, was observable all through. It is evident, therefore, that a mere enumeration of the number of entries gives but a very uncertain criterion of the nature of the exhibition. It appears indeed to have become a custom with a certain class of people to make trifling entries of articles which they have no intention of showing, merely for the convenience of having an exhibitor's ticket.

The exhibition grounds, though not so picturesque as those at Hamilton, were equally commodious, and within a reasonable distance of the railway stations. A sheet of water, occupying the northern extremity, was found very convenient for the use of the stock, and the sheds for the cattle were as good as any that have yet been provided. On this subject, however, we shall have something to say hereafter. The main building is in all respects creditable to the people of London. It is of an octagonal shape, the area on the ground floor being upwards of 24,000 feet, the galleries giving an additional space of 4,000 feet. The external wall is of white brick, 21 feet in height. The second tier of wall is of wood, and rises to the height of 32 feet above the ground, including the pitch of the roof of the exterior part; within this second tier are the galleries. The third tier within this again, which is a continuation of the inside gallery wall, and also of wood, rises ten feet higher, and above this again is a cupola, which

brings the entire height of the building to something under 100 feet. The whole cost was under $9,000. The ground floor was occupied with grain, seeds, and manufactures of a bulky nature, the gallery being devoted to ladies' work, fine arts, and other light articles. The roots and garden produce were stored outside in a large tent erected for the purpose. The horse boxes and a portion of the cattle stalls were erected against the fence on the eastern side. The remainder of the cattle sheds and the pens for sheep and pigs were in rows running east and west in the same portion of the ground.

With these remarks upon the general character of the exhibition, we shall now proceed to give an account in detail of the articles especially worthy of notice in those classes in which farmers are more particularly interested, commencing with the live stock, and giving, as is meet, the most prominent place to that noblest of quadrupeds—

### THE HORSE.

There is nothing in a show of this kind so difficult to report upon, with any degree of satisfaction, as the horses. In the first place, they are either confined in stalls carefully locked up, except when the groom is in actual attendance upon them, or they are being exhibited in a ring, when it is no easy matter to obtain any precise information respecting them. In this instance the show of blood horses was so extremely poor that the less said about them the better. Dr. Morton's imported horse "An onio," a full description of which was given in the *Agriculturist* of 1860, unfortunately died at the commencement of the season, and we have heard of no fresh importation capable of supplying his place.

The display of saddle and carriage horses in the ring was very large, and attracted a great deal of attention. The show included some nice animals of both kinds, useful as well as ornamental. To my mind, however, the "sulky" and the trotting horse are too suggestive of all that is vulgar and disreputable to be at all in keeping with a sober agricultural show, or even a well conducted racecourse.

The show of stallions in the agricultural class was considered by the judges to be extremely good as compared with former years, the entries were numerous, and the animals had, in great perfection, that combination of size, bone, and activity which is so desirable in a useful farmer's horse. The first prize in this class was taken by T. Gowla of York, in the County of Haldimand.

A good coaching horse has long been considered a desideratum in this country, although several importations have lately been made with a view of supplying the deficiency we are not aware that it has been done yet with entire success. However that may be, the animals shown in this class have been steadily improving, and the show at London was exceedingly good. There is something singular in the way the prizes were awarded in this class; the third prize four-year old stallion took the diploma as the best stallion of any age, while the first prize four-year old was again successful in obtaining the prize of $60 offered by the Prince of Wales as the best stallion for general purposes!* This animal, which, after being thus singularly beaten for the third prize, after he had himself taken the first, was so fortunate as to be again successful in competing for the most valuable prize of the whole exhibition, was owned by Mr. Armstrong, of Union, near London

The show of heavy draft horses was good in proportion to other classes. The first prize was taken by Mr. R. Ferris's imported Robin Hood, a magnificent animal, and wonderfully active, for his weight. Mr. George Miller's imported Clydesdale fillies also attracted much attention.

### HORNED CATTLE.

SHORT HORNS.—The whole number of Durhams exhibited did not much exceed 50, although the list of entries was much larger. F. W. Stone, Esq., of Moreton Lodge, Guelph, was, as usual, one of the principal exhibitors. To his bull, "Third Grand Duke," the first prize was properly awarded, first in his own class, secondly as the best Durham bull of any age, and lastly as the best bull of any breed. Grand Duke is a very showy animal, of the style which has taken precedence of all others, and combines in a remarkable degree the qualities for which this breed is remarkable. Mr. Stone also exhibited four cows, one of which, "Desdemona," took the first prize in her class; one yearling bull, two yearling heifers, and two bull calves, all of which took prizes in their

* This is accounted for by the 1st and 2nd prize horses having been entered for the diploma. ED.

ective classes. These are all animals of e very highest class, both in point of breed- and good quality, and would be worthy of place in any agricultural show in the world. Mr. George Miller, of Markham, another our principal importers and indeed one of y earliest, and to whom our farmers are ely indebted, was also an exhibitor in this s, as well as in a number of others. His l. Prince of Wales, which took the first e at Hamilton as a two year old, is a utiful animal, although this year he re- ed places with Mr. White's "Milton," ich took the first prize, having taken the ond last year. Mr. Miller's two cows were successful in their classes as was also a y nice heifer calf belonging to his herd.

Mr. John Miller, of Brougham, was de- edly awarded the first prize for his year- bull, and the second for his bull calf, both them, the yearling especially, being ani- of first rate quality.

One of the finest animals upon the ground, gh of a style that is now considered some- t out of date, was the three year old bull ady alluded to, belonging to Mr. James ite, of Bronte, County of Halton, which the first prize in his class. Mr. White took the first prize for a fat ox, a short n grade, a monster weighing 27 cwt. as stood, a noble animal of his kind, and one will cut up well at Christmas, for the fit, we trust, of our St. Lawrence market.

Mr. J. Snell, of Edmonton, Chinguacousy, a good two year old bull, the first prize calf, and some nice heifers, all well bred of good quality.

Among the cows of this class, one of the remarkable, though by no means the somest, was one shown by Capt. Shore, St. Thomas; the width of this creature, ss the hips was something marvellous her size altogether was uncommon, even Durham, still she was too coarse for the of a breeder, although the judges did her next to Mr. Stone's Desdemona.

Two cows shown by Mr. Welford, of dstock, displayed excellent breeding, and f them, in our opinion, was deserving of ter place than she obtained. They were ery large, but had all the points of the am in perfection.

o the gentleman whose name we are now to mention we perhaps owe an apology, ot having spoken sooner of the valuable ion which he has made to our thorough-bred stock. We allude to Mr G. H. Phillips' of Prescott, whose recent importation of Shorthorns from Ireland, the first that have come from that portion of the empire, is one of the events of the year. Two of Mr Phillips' cows are really very fine and his whole herd is of superior quality. Among other exhibitors in this class we may mention A. Hogge, of Guelph, G. Black, of St. Mary's, J. Anderson, of Guelph, John Iles, Guelph, and G. Robson, of London.

It was not till Wednesday morning that the prizes in this class were decided, and in some of the classes the contest was very keen. This was especially the case in that for the diploma for the best bull of any age. Several animals were sent into the ring, but all were soon dismissed except Mr. Stone's "Grand Duke," Mr. Miller's "Prince Albert," and Mr. White's "Milton." The Judges were evidently much divided, and it was some time before they came to a conclusion. It was indeed no very easy task, as the three animals were very perfect, though somewhat differing in style. At last, however, the decision was made in favour of "Grand Duke."

For the herd here were only three entries, Mr. Stone's, Mr. Miller's, and Mr. Phillips'. But Grand Duke, Desdemona, and the prize heifers, formed a combination perfectly irresistible, and no difficulty was made in adjudging the prize in their favour.

Devons.—Next to the Durhams, in general value and importance, though at this show exceeding them in number, come the Devons. Of this breed we reckoned over ninety head.

W. H. Locke, of Yarmouth, is well known as the principal exhibitor of this breed, and, being so near at home, he was able to display his herd to the best possible advantage.

His entries numbered some forty, including two very fine bulls, and an infinite series of females, from the great-great-grand-dam of the herd down to calves of a tender age. Mr. Locke very wisely eschews pens and sheds, and his cattle, standing together in some conspicuous part of the ground, make a sight of never ceasing attraction.

Next to Mr. Locke, his neighbour, Mr. Pincombe, a name hitherto unknown in our prize list, deserves to be mentioned. Mr. Pincombe made his *debut* with no less than thirty head, chiefly bred from stock purchased from Mr. Locke. In Mr. Pincombe's hands they certainly have not degenerated. A heifer calf of his is the finest animal of the

breed that we have ever seen. In the classes for cows and heifers, Messrs. Locke and Pincombe divided most of the premiums between them.

Mr. Courtice, of Bowmanville, is another Devon breeder of note, and his stock, though not large, is excellent.

Mr. Tye's cattle we were glad to see this year in very much improved condition, and they deservedly carried off several prizes. His stock are of an excellent strain of blood, and, though not large, only want a little better feeding to place them in the very first rank. Some of his heifers this year it would be hard to beat.

Mr. Mason, of Nissouri, showed two very nice bulls, and among other exhibitors we may mention C. A. Woodhull, of Komoka, C. Beer, of Katesville, and S. Peters, of London.

Mr. Rykert, of St. Catherines, we are sorry to say, was not an exhibitor this year.

The valuable herd that used to belong to Mr. Ferrie, of Doon, has, we regret to learn, been broken up since the last exhibition.

Herefords.—The enterprise of Mr. Stone in importing a bull and eight heifers of this valuable breed will, it is to be hoped, prevent it from falling entirely out of use as as one time appeared likely to be the case. For some time past the specimens of Herefords exhibited have been so poor as to give the public a very unfair idea of the real merits of the breed. Mr. Stone's cattle, however, are of the best quality, one of his heifers having taken the first prize at the exhibition of the Royal Society, held last year at Canterbury. Their compactness of form, neatness and elegance of shape, cannot fail to strike the eye of the most casual observer, and as, perhaps, the most profitable breed for the butcher, they can scarcely fail of being fully appreciated. As a cross upon the common cattle of the country there is nothing better, and certainly nothing so durable in its effects as the Hereford.

Mr. McMicking, of Stamford, and Mr. H J. Lawry, of Hamilton, were the only other exhibitors of the breed; Mr. McMicking's cattle are very much improved upon what he has shown lately, and made a very creditable display.

Ayrshires.—This breed showed a very great improvement over last year, both in the number and quality of the articles exhibited. Mr. Wright, of Cobourg, was, as usual, on in great force, and his stock, if anything, mor attractive than we have ever seen it before Two of his cows, in particular, were picture of elegance and symmetry, and by no mean deficient in size. The milking qualities o this breed are unquestioned, and in point o size they are capable of attaining greate weight than is generally supposed.

Mr. Morton, of Gananoque, is also a large exhibitor, having some thirteen head, includ ing three fine cows, some nice heifers and bu calves. This lot had just returned from th New York State Fair at Watertown, where they carried off a large number of prizes.

The stock of R. L. Denison, Esq., th treasurer of the Association, was well repre sented, and included a number of very fin animals, of excellent style and breeding, an in much better condition than they were la year.

Mr. Staunton, of St. George's, had fou head of nice cattle. Mr. W. H. Esery, o Avon, and H. G. Frank, of Strathroy, wer also successful exhibitors.

The first prize for aged bulls was taken b Mr. Nimmo, of Clarke's Mills, Camden Eas although the diploma for the best bull of an age was awarded to a yearling belonging Mr. Wright, who also obtained the prize f the best herd.

In striking contrast to the animals we ha been describing was a cow just imported b S. Beattie, of Woburn, a diminutive animal apparently a totally different strain, ve pretty, but very small; too small, we shou imagine, whatever her breeding may be, find much favour in this country, where si is, too much perhaps, regarded as the mo essential quality in all breeds.

Galloways.—The show of Galloways, not superior to that of last year, was suf ciently good to prove that there is no dimin tion in the growing popularity of this exc lent herd. We notice the importation of lot of six new animals by Mr. George Mill all of the best quality, which took seve prizes.

Mr. John Snell, of Edmonton, was one the principal exhibitors, and his herd w successful in obtaining the prize agai strong competition.

J. Roddick, of Brantford, one of the ea est exhibitors in this breed, had a number entries. Mr. Fleming, also of York, anot of the introducers of Galloways, displa

ame fine animals. Both of these breeders ere very successful in the way of prizes. Among other exhibitors we may mention r. Graham, of Woodbridge, Mr. Kerr, of Westminster, Mr. Lyons, of Flamboro, and Mr. Jardine, of Saltfleet.

Mr. J. Nimmo, of Camden East, had a ne lot of cattle somewhat resembling the Galloways, of what we believe are called the Polled Angus or Aberdeen Breed, which the judges deemed worthy of being placed in a separate class by themselves, and therefore they did not appear in any of the prize lists published at the time of the show.

Another extra entry was made by Mr. J. Curry, of Belmont, of a lot of West Highland cattle, which he obtained, we believe, from Captain McLeod, of Drynoch, Yonge Street, near Toronto, by whom they were originally imported. The breed is very small, though heavy in the carcass in proportion to their height, and exceedingly hardy. For general use they are too small, but the new settler might find them very useful from their power of enduring hardship.

GRADES.—The show of Grade cattle was very large, though nothing extra in point of quality. Some of the heifers shown were very fine, though not equal to some we have seen in former years. A. Hogge, of Guelph, J. Biker, of Simcoe, T. Stock, of East Flamboro, S. Peters, of London, and J. R. Pettit, of Grimsby, were the principal exhibitors.

The Fergus Cup presented by the Hon. Adam Fergusson, was awarded to Mr. Thomas Stock, of East Flamboro.

FAT AND WORKING OXEN.—Of one of the three fat oxen we have already spoken, viz: that belonging to Mr. White of Halton. Two other very fine beasts were shown by Mr. O'Rourke, of Shakespeare. The first prize for the fat cow was taken by W. Elliott, of Eggleston, for a very neat well fed animal; and the second by J. Pearce of Tyrconnell.

The show of Working oxen was, as before remarked, exceedingly good. The Townships of London and Westminster each sent a team of ten yoke. The London cattle were large and heavy, but better suited for stall feeding than for the yoke. Those from Westminster were not so heavy, but younger, and altogether a better lot of working cattle, and to them the prize of £10 was properly given. Among the Devons exhibited there were some splendid specimens of working oxen, but several among the others shown should not have been sent in at all. It may be remarked, however, that the cattle shown as working oxen were *bona fide* such, and not merely made up for the chance of a premium.

BEST BULL OF ANY BREED.—One of the most interesting things in the cattle department was the show of bulls entered in the sweepstakes to be given to the best bull of any age or breed. The competitors were numerous, and with the exception of the Herefords all the breeds were well represented, and their various qualities excellently contrasted. Six Durhams, two Devons, six Galloways and three Ayrshires entered the lists, and a very pretty sight they made. Some discussion we understand took place between the judges as to the grounds on which their decision was to be given, whether the prize was to be given to what they claimed the best animal, taking breed into consideration, or to the most perfect animal of any breed, but without bringing the relative merits of the different breeds into the question. The latter appears to us the rule most in accordance with reason and with the terms upon which the prize was offered; but the judges, we understand, took the other view. At all events they gave the prize to Mr. Stone's "3rd Grand Duke," a decision which we should be very sorry to impugn.

## THE SHEEP.

COTSWOLDS.—The popularity of the Cotswold certainly shows no sign of decline. The number of entries was large and the show of excellent quality, and, which is a much better test of the estimation in which the breed is held, we have heard of a number of sales of rams to farmers in all parts of the country. The prizes, however, were principally divided between two breeders, Messrs. Stone and Snell. Mr. Stone's show of Cotswolds was as usual very large, the animals he exhibited being chiefly of that breed, Mr. Snell's show of sheep was larger, numbering sixty-seven altogether, including Cotswolds, Leicesters and other long-woolled varieties, chiefly Lincolnshire. We may mention here, that among Mr. George Miller's importations this year, there were eight Cotswolds. His other importations of sheep we shall mention in due course.

LEICESTERS.—In this class, as well as in other long-woolled varieties, Mr. Snell was a large exhibitor and took several prizes. Mr.

John Miller of Brougham showed six rams of different ages, besides fourteen ewes, and Mr. George Miller's name appears again as an importer of twelve new specimens. Simon Beattie, of Woburn, who though but a young man and a young breeder, made an excellent display this year, was also a prominent exhibitor in this class. A number of prizes were taken also by Mr C. Walker of London, whose sheep were very much admired. Mr. John Long of London was another importer. But, in the opinion of many, the purest and best Leicesters on the ground were a couple of rams shown by Mr. Stone, out of a magnificent lot of thirty-one which had arrived only a week before direct from one of the first English breeders. These sheep, which we have since had an opportunity of seeing, are well worthy the attention of all who wish to get a really pure Leicester, free from any intermixture of Cotswold, Lincoln, or any other long-woolled variety.

CHEVIOTS.—The show of Cheviots was enriched this year by the addition of a new lot of very fine ones just imported by Mr. George Miller. The other exhibitors were Messrs. Dickson of Otono, D. Elliott, of Strabane, and T. Guy, of Oshawa.

OTHER LONG WOOLLED SHEEP.—In this class, which contains an *omnium gatherum* of all sorts of long-woolled varieties, there were a number of entries, including several Lincolnshire, Teeswater, and crosses of various kinds. Some of the animals in it were very fine, and the class is a valuable one, as enabling exhibitors to put forward a number of specimens which they could not legitimately enter in any other way except as extras, which is a very unsatisfactory mode of entering. Mr. Snell was the principal exhibitor in this class, but Mr. John Miller rivalled him successfully in several instances.

SOUTHDOWNS.—No breed has made greater advances in a short time than the Southdown, of which the show this year was exceedingly good, and larger than any we have ever had before. The principal feature this year was the exhibition of two shearling rams from the flock of the celebrated Jonas Webb, bought at the closing sale of that great breeder by our enterprising friend Mr. Stone. Both of these animals were a good deal out of condition, but a little examination showed them to be very superior. Some nice ewes were shown by J. Maxwell, of Paris, and J. Peers, of Woodstock, and some fine lambs by M Dickie, of Dumfries. Mr. J. Spencer, Brooklin, however, was, as usual, the large and most successful exhibitor, but we do n think that his sheep have been improved late a fact which is owing probably to a sligh intermixture of Hampshire Down blood. M Milne, of Markham, was another of the princ pal exhibitors in this class.

MERINOS AND SAXONS,—Both the Frenc and the Spanish Merinos were well represent ed, the former by Mr. Rymal and Mr Young of Wentworth, and the latter by Mr. Arkland of Oshawa, and Mr. Miller of Grantham. I the opinion of the judges, however, the Span ish Merinos shown by Mr. Arkland, many o them, we believe, lately imported from Ver mont, carried off the palm. They were i fact declared by the judges to be of very su perior quality.

OTHER SHORT WOOLLED BREEDS.—In thi class which answers to the corresponding class in the Long woolled breeds, were shown a number of excellent sheep, chiefly Hamp shire Downs, and crosses between Hampshire and Southdown. Among these, as among the Southdowns proper, there was pretty strong competition. The chief exhibitor of Hamp shire Downs was Mr. Spencer, who carried off most of the prizes. Mr. Tye of Wilmo had several sheep of a similar kind, though no so good. To show well, the Hampshire Down require to be in very good condition. Be sides these there were two lots of a new de scription, the Shropshire Down, recently im ported, one by Col. Brearley of Woodstock and the other by Mr. George Miller. Be tween these two there was a great deal o difference, the latter being superior in size and in the quality of the wool. Mr. Miller sheep are a little larger than the Southdown with longer wool but not so fine, though mor lustrous. As these sheep are quite new t us we cannot say much as to their merits, bu judging from those chosen by Mr. Miller, w should not consider them so valuable a bree as the South or Sussex Down, or perhaps even the Hampshire Down.

### PIGS.

The show of pigs was certainly one of t redeeming features of the exhibition, a was unquestionably the best that we ha had for many years, nor was the improveme confined to any particular class, large; sm and middle breeds equally partook of it. T

Yorkshires were better represented than we have ever seen them, and as akin to them we may notice two fine sows just imported by Mr. G. Miller, which he calls the Cumberland improved. They are very large, white, and with fine skins. Of Yorkshires the principle exhibitors were S. H. Reeve of Derry West, C. A. Jordison of Belleville, and Messrs. Long & Kent of London. Of the large breed of Berkshires there were also some fine specimens, the chief exhibitors being J. Collins of Mount Elgin, S. Baker of Simcoe, and Jordison of Belleville.

In the class for "all other large breeds" besides those above mentioned, there were some very fine animals shown by J. Black of St. Thomas, J. Barns and J Brady of the same place. Of the small breeds the principal varieties were the improved Berkshire, which appeared to be the most popular, the Suffolk, which was also well represented, and the Essex. In all these classes were many specimens worthy of the highest commendation. Of the Suffolk breed the principal exhibitors were J. Main of Peel, and J. McGiashan of Nelland. Of Berkshires T. Penton of Paris and D Buchan of Toronto. Of Essex Mr. Tye of Wilmot.

Before concluding our notice of the live stock we cannot help remarking that though the tendency to excessive feeding, pretty strongly developed in some quarters, has not yet reached very extreme limits, there is a tendency afloat now more deserving of repression—that of seeking to obtain size and weight in the animal by experimental crosses rather than by the more legitimate mode of developing the qualities of the original breed. If a man wants a large animal, whether it is sheep, a pig, or an ox, if mere size is his great object, let him at once adopt a large breed, of which there are varieties to suit every fancy. Instead of this too many try to attain the object by crossing one breed upon another, the almost invariable result of which is to lose the distinctive characters of each, and in all probability to lose all their most valuable qualities. In some cases one cross for the other is all very well, but beyond this every day year's experience of our Provincial shows proves the system to be a bad one. We have seen several instances in which a realy valuable flock has been quite ruined for breed purposes by this process, and the breeder has been compelled to go back at considerable cost to the original stock with which he commenced. A small breed are valuable because they are small, and therefore easily kept and quickly fattened, and a large one because they are capable of attaining to a great weight; these respective values being ruled by the nature of the country for which the animal is required,and therefore the attempt to mix the two at once defeats the object in view, besides destroying the purity of blood, with ut which no breeding can be successfully carried on.

*(To be continued.)*

## Miscellaneous.

Scotch and English Terriers.—Of these varieties Richardson gives the following description :—

*The Scotch Terrier*—There are two varieties of the common Scotch Terrier. One which stands rather high on his hind legs, is usually of a sandy-red color, and very strongly made—he stands about eighteen or twenty inches in height, and is commonly called the "Highland terrier." The other is lower, long-backed, and short-legged; hair more wiry, but not so long as in the former; mouth also not so broad, and muzzle longer. This latter variety is the dog celebrated by Sir W. Scott as the Pepper and Mustard or Dandie Dinmont breed.

*The Skye Terrier.*—So called from its being found in the greatest perfection in the Western Isles of Scotland, and the Isle of Skye in particular, somewhat resembles the preceding, but is even longer in the body, lower on the legs, and is covered with very long, not coarse hair; its ears are erect, and tufted at the extremities. All the Scotch Terriers are "varmint" in the extreme, being equalled by no other dog in the ardor with which they hunt and destroy the rat, cat, weasel—in fact anything that has *fight* in it; and, lacking other game, they will gladly and fiercely engage in combat with each other.

*The Euglish Terrier.*—A light, active, and graceful little dog, usually of a black and tan color—and those of this tint are the best—but sometimes white. If black and tan, they should not present a speck of white; and if white they should be entirely of that color.

The English Terrier is, in combat, as game as the Scotch, but less hardy in enduring cold or constant immersion in water. It appears most probable that the rough or Scotch breed was the primitive stock, and that the smooth or English varieties are the result of artificial culture.

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Winter Fruit, to keep well, should remain on the trees as long as frost will allow, then remove to some dry shelter for a time, before packing away in cellar or pit.

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