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THE

Canadian Agriculturist,

OR

URNAL AND TRANSACTIONS OF THE BOARD OF AGRICULTURE

OF UPPER CANADA.

L. XII. TORONTO, OCTOBER 1, 1860. No. 19.

Farm Yard Manure.

w subjects deserve greater consideration at hands of Canadian farmers than the advan- ous management and application of farm manure. Many thousands of pounds are ally lost from ignorance or neglect of these rtant matters. Professor Voelcker, the lling chemist of the Royal Agricultural ty of England, a short time since went into laborious investigations respecting the osition of this kind of manure, and the ges and deterioration to which it is ordi- subjected. His experiments were made considerable quantities, treated in different ers, for the purpose of observing the ges it undergoes; and great care appears ve been exercised in all the operations, articularly in selecting samples for analysis. these investigations it would appear that reat loss to which farm yard manure is et is not so much from evaporation of am- into the air, as has hitherto been com- supposed, but chiefly *from the action of washing out the soluble matter.* The f ammonia by exposure, unless t e mass is ted to a considerable degree of fermenta- ppears to be in reality very small. The ing table, giving the composition in pounds experimental heap of manure at four different periods, will afford the reader some idea of the changes which occur:—

	Put up Nov. 3d, 1854.	April 30, 1855.	August 23rd.	November 15.
Weight of manure in lbs.	2833.	2026.	1994.	1974.
Water	1877.9	1336.1	1505 3	1466.5
Dry Matter	960.1	689.9	488.7	507.5
Soluble organic matter.	70.38	86.51	58.83	54.04
Soluble inorganic matter	43 71	57 88	39.16	36.89
Insoluble organic matter	731.07	389.74	243.22	214.92
Insoluble inorganic matter	114.94	155 77	147.49	201.65
	960 1	689.9	488.7	507.5
Total nitrogen	18.23	18.14	13.14	13.03
Equal to ammonia	22.14	22.04	15.96	15.75

It is to be observed that, during the first six months, although the weight of the manure largely diminished, the loss was almost exclusively confined to the insoluble organic matter; while the soluble matter had increased, and the ammonia remained undiminished. But during the hot summer weather all the most valuable matters had undergone diminution.

Many important and elaborate analyses made by Dr. Voelcker, show the composition of the dung when treated under different systems. The conclusions to which they lead are these:—Farm yard manure in its fresh state contains but a small quantity of ammonia, most of its nitrogen being there as insoluble nitrogenous matter. But as the decomposition advances the ammonia increases, and a quantity of organic matters become soluble. For this reason the manure

should be preserved in such a manner as to prevent the escape of the soluble portions, which are the most valuable. This can be effected by keeping it in water-tight pits, or under cover; but, in the latter case, the manure, particularly if it contain a large proportion of litter, is not sufficiently moist to admit of its ready fermentation, and water must be added in sufficient quantity to promote that change. The worst of all modes of keeping manure is to pile it in heaps in the corners of the fields, for under such circumstances it is most liable to loss; and if the manure must be carted out, it is better to spread it upon the soil at once, because when this is done, fermentation is stopped and there is very little free ammonia, the loss is small, and the soluble matters are uniformly washed into the soil by the rain. Dr. Voelcker is of opinion that the most advantageous mode of applying the manure would be in all cases to leave it on the surface to be washed into the soil, by which means its distribution is more uniform than if it be ploughed in. The most disadvantageous mode of making manure is to produce it by cattle in open yards, for in this way at least two-thirds of the valuable matters are lost after a year's exposure.

Editorial Correspondence.

(No. 7.)

London, August 29, 1860.

THE HIGHLAND SOCIETY'S EXHIBITION AT DUMFRIES.

In my last I gave a general description of the live stock department of this national exhibition, reserving for a future communication some account of the implements and machines. Constant travelling and a pressure of engagements have prevented me from doing this till the present.

The number of entries in the implement department of the Scottish Show reached nearly a thousand. These were arranged under separate sections, a method very convenient and advantageous to the visitors, but not, as I understood, altogether approved by the manufacturers; any of whom exhibiting a number of different implements had their productions scattered over the show yard. In the English Society's grounds, each manufacturer had his own distinct stand, where all that he exhibited was arranged together, and protected from the weather in long rows of neatly covered sheds. The Highland Society has a better and more convenient classification, but provides no protection, the articles being exposed in groups in the open air. A number of articles however were exhibited in "General Collections," but in competing for premiums each article had to be shown in its respective section. The readiest way, perhaps, of giving the reader a definite notion of the nature and extent of this important department of the show will be a statement of the number of implements entered in the different sections.

In section 1, comprising two-horse Ploughs for general purposes, there were 28 entries. Trench or deep furrow ploughs, 5; Subsoil ploughs for two horses, 2; do. for three or four horses, 2; Double mould-board ploughs, 2; Ribbing Ploughs, 2; two-horse grubber cultivators, 15; Norwegian harrows or pulverising land rollers, 6; Consolidating land rollers, 13; Land pressers, 4; Ribbing machines, 2; Harrows for heavy land, 14; Harrows for light land, 20; Harrows for covering seeds, 12; Common swing-trees, 10; Equalising swing-trees for more than two horses, 9; Broadcast sowing machines for grain, 8; Drill-Sowing machines for grain, 6; Sowing machines for grass seed, 5; Sowing machines for turnips, 1; Sowing machines for turnips with manure, 1; Dibbling or drop-sowing machines with manure, 1; Sowing machines for mangold, 8; Sowing machines for carrots, 1; Three-row scarifying machines for beans, 2; One-row do for beans, 2; Machines for pulverising guano, 7; Machines for distributing guano in drills or broadcast, 1; Liquid manure distributing machines, 2; Drill-hoes for drilled grain crops, 3; Horse-hoes for green crops, 22; Machines for singling turnips, 1; Machines for raising potatoes, 2; Scarifiers for general purposes, 3; Reaping machines with delivery, 7; Reaping machines, manual delivery, 15; Horse stubble or hay rakes, 10; Turnip machines for two or more horses, 8; Turnip machines with steam power, 6; Fanning machines for winnowing grain, 11; Fanning or other machines for cleaning grass seeds, 1; Weighing machines for grain, 5; Weighing machines, indicating from one pound to tons, 16; Straw cutters for hand labour, 1; Straw cutters for power, 10; Turnip cutters for cattle, 11; Turnip cutters for sheep, 7; Chaff cutters for sheep, attachable to a cart

s for pulping turnips and roots, 12; Root ers, 4; Linseed bruisers for hand labor, il-cake breakers for hand labor, 14; Grain 'ers or bruisers for power, 10; Steaming ratus for cattle food, 6; Feeding troughs ges, 3; Feeding troughs for sheep, 5; p fodder racks, 4; Churns worked by hand, Churns worked by power, 3; Cheese presses, sets of dairy utensils, 2; one-horse carts, harvest frames, 14; Harvest carts, 4; spring carts, 6; Drags, for carts, 14; lbarrows of malleable iron, 4; Barrows onveying cooked food for cattle, 6; Divi- racks and mangers for farm stables, 4; harness, 2: Stack pillars, with frame 3; Field gates, constructed entirely of 1; Field gates not constructed entirely of 2; Iron hurdles for cattle fence, 2; Iron g, for sheep fence; Wooden hurdles, or fencing for sheep, 2; Pipe or drain tile nes for hand or power, 3; Pipes for con- water under pressure, 2; Tiles and pipes ld drainage, 5; Glazed socketed pipes for ge, 3; Tools for cutting field drains, 2; for cutting open drains in hill pastures, neral collections of implements and ma- , 23; extra implements and machines, 67.

ill be seen from the preceding analysis e exhibition embraced nearly or quite all plements and machines that belong to the improved condition of British husbandry. more heavy and expensive machinery the as somewhat deficient, but the ordinary ents of the farm were well represented, terised by simplicity of construction, good anship and moderate prices. There was e absence of steam ploughs and cultiva- hich imparted so interesting and valuable e to the English and Irish shows. There resent, I understood, only two of Fowler's loughs, and one of Smith's steam culti- in use, in Scotland. The practicability irableness of employing steam as a mo- er in field culture have now become to generally acknowledged, and very im- changes in this department of rural labor dently take place, before many years

Deeper and more economical cultiva- rough drainage, discriminate manuring nation of crops, with continued improve- the various breeds of live stock, consti- enduring basis of the advancing condi- ritish Agriculture.

A trial of ploughs and other implements took place in a field near the show ground, but apart from the assistance thus afforded the Judges, I am not aware of any very definite or important results having been obtained. An opinion was pretty generally expressed that the English wheel ploughs were not easily held; arising most probably from want of practice in the ploughmen with such implements; as wheel ploughs where they have been fairly introduced are consid ered more easily managed than any other description. The threshing machines and barn machinery were tried on the show grounds; but in consequence of the very backward state of the grain crops, the practical testing of the reaping machines was very properly deferred for a few weeks. These machines are mostly constructed on principles which are familiar to farmers in Canada and the United States, with more or less of modifications, adapting them to the special conditions of the crops and climate of Britain. It will be recollected that the first reaping machine brought into practical operation was the invention of a Scotch Clergyman, the Rev. P. Bell, whose machine has been greatly modified and improved by an English manufacturer, and many of the most competent judges consider it among the best of its class. Most of the machines, however, were constructed on Hussey's principle, so well understood and appreciated on this side the Atlantic.

I cannot conclude this hurried and imperfect sketch of the Highland Society's Exhibition without acknowledging the kind attention shown me by Mr. Hall Maxwell, the able and indefatigable Secretary, Mr. Robt. Russell, and other members of the Directory. Mr. Russell, it will be remembered by several of the readers of the *Agriculturist*, is the same gentleman who visited our Provincial Exhibition when it was held in London; who spent nearly a year on this continent, and who has written the best book on the agriculture, climate, and resources of North America that ever issued from the British press. I deeply regret that my stay in Scotland was necessarily so very brief, for no part of my travels afforded me greater pleasure, or equal opportunities of gaining valuable information.

I was so fortunate as to be in Edinburgh when Her Majesty reviewed the Scottish Volunteers, in the park attached to the old Palace of Holyrood, where upwards of twenty thousand young men were collected from all parts of Scotland,

the flower and pride of their country, to do homage to a Sovereign who reigns in the hearts of her people, and to show the world their determination to do their utmost to maintain, whenever the hour of peril may arrive, the honor and independence of Great Britain. It was truly a heart stirring scene, indescribable by words; and as such it was evidently felt by more than three hundred thousand delighted spectators! The locality is peculiarly favorable for such a display, beyond, perhaps, any other in the British Islands. Who can doubt that with such a spirit as now animates the great masses of the British people, the dignity of the crown, the rights and happiness of the people and the independence of the nation, will, under the protecting arm of Providence, yet continue to be perpetuated through many coming generations.

G. B.

On Cattle Distemper.

[Having recently had the pleasure of a personal interview with Professor Dick, in Scotland, the subject of the prevalent cattle disease denominated *Pleuro Pneumonia*, which has already shown itself in the State of Massachusetts, naturally came up in conversation. The Professor kindly favored us with a copy of the following article, which appeared in the Transactions of the Highland and Agricultural Society of Scotland, for March 1858. The long experience and high authority of the writer on matters of the greatest interest to stock breeders in all parts of the world, will be considered amply sufficient to justify the insertion of the article entire, in the columns of this journal. We heard while in Europe an expression of opinion by several veterinarians of eminence that the disease which has destroyed so large an amount of cattle, and which has already made its advent on this side the Atlantic, is caused, or at least fatally aggravated, by a want of cleanliness, proper ventilation and shelter, and an adequate supply of nutritious food. The following paper will supply the reader with abundance of material for thought and practical application.—Ed.]

When the report became current that a contagious epizootic had attacked cattle to a great extent throughout the continent of Europe, and was rapidly approaching our shores, my attention was naturally directed to the subject; and, from what I could learn, I came to the conclusion that there was much unnecessary a that the disease would neither prove so fe ble nor so dangerous as was supposed; a if ever it reached this country, it would b manageable than it was represented to be Continent. The alarm was excited b accounts in the newspapers of the high tagious character of the disease.

On the first visitation of the cholera, I in 1832, while a general opinion prevail it was highly contagious, I showed that a malady had attacked horses and cattle; I fore inferred that the disease was an e produced by atmospheric causes operat local influences. The result has proved t rectness of that opinion. Before the E epizootica, or vesicular murrain, which b vailed on the Continent, made its appe here, from the description I had read of in consequence of numerous communi from old pupils, I wrote a circular letter subject, showing that it was an epizoot one of comparatively small moment, an curable by a little care, cleanliness, and tion, and that when it did break out in th try, its attacks were very sudden, and ind nately affected all the domestic animals the horse. Although it was found to be some, and required a good deal of atte seldom proved fatal, and in those cases i it did, this arose entirely from inattent want of cleanliness; so simple, indeed prove, that a veterinary surgeon was called in. Its sudden appearance and r sidence soon proved that it was not pr by contagion, for when a flock of she herd of swine, or a byre full of ca attacked, it generally affected the whol animals in a night's time; all seemed at once, the disease being similar to the about our lips from exposure to co Herpes. It occasionally, however, only one side of a byre, and in other cas every alternate cow in the byre became while the others escaped. The disea over a great part of the country, b time gradually disappeared, its chief i ing been throwing back in condition mals it attacked, and in the case of producing a species of foot-rot, gradually their hoofs.

When pleuro pneumonia followed, i fidently declared by some that it was of the previous murrain, and that i highly contagious; very few, howe have any knowledge of the disease p now believe in its contagious charact however, prevailed to a very great e for a number of years, as an epizo have no doubt will continue for a c time, unless proper means are adop prevention. But what, it will be those means? will not a careful se the diseased from the healthy do t not a strict quarantine prevent its

icated to healthy animals? I think not, ause it is not, and has not been proved to contagious, as I shall endeavour to show. l the disease prevails to a great extent ughout the country. How, then, is it to be vented? By attending to the real causes of disease, and avoiding them. If the disease nded entirely on its contagious nature, the ns adopted in Prussia and other Continental tries would speedily extinguish it; but that not been the case. What, then, are the es of the disease? They are atmospheric, duced by the want of proper shelter in the , or confining cattle in exposed situations in re weather, or the want of proper ventila- and drainage of byres. As the seasons vary, rent classes of animals become more sus- ible of disease than others, and different s of disease present themselves in the same s of animals in different seasons. In horses, xample, we have different types of disease; found last autumn a kind of diabetes very ral; while during the previous winter and g influenza prevailed to a very great extent; me seasons we find catarrhal fever prevail- and in others again pneumonia or pleuro monia. Yet curious enough, although ro pneumonia has been prevailing so gener- throughout the country in cattle for a num- of years past, that disease has not been non in horses, but lately has been affecting p on Mr. Finnie's farm of Swanston.

stemper in dogs has also its seasons, and rabies in various animals occasionally ap- as an epizootic. All these have their ns and localities, more or less extensive, ding to local or general influences. They g into existence from a combination of s which we frequently cannot recognise, hich are nevertheless the origin of these ses. In such cases we are very apt to be- that the diseases are produced by a conta- and think that this at once accounts for ppearance and spreading of the disease. f contagion is the cause of the disease, ce its origin? It must have at first been ated from some cause or causes other than gion, and if so, why may not the original s be in operation, and be the sole means of gating the disease? Contagionists allow t must have had an origin, but contend when once generated it propagates itself ntagion. But why overlook the fact of its originally generated without contagion? ne instance, why not in another? and if it not of vast importance to trace out tely those causes, instead of wasting time ncurring great expense in adopting only to prevent contagion, when in reality the does not arise from that cause? It is a and easy explanation to say that the of a disease is contagion; taking that for d on the Continent, the various States t to stop the progress of disease by a ry process; they not only destroy the diseased beasts, but all others who may have come in contact with them. But even this they find does not always succeed, as fresh cases constantly occur in other places, and they are likewise destroyed; by these means the apparent mortality of the disease is greatly augmented, all those which are slaughtered being included in the number of the victims. Attempts have been made to show that if the beasts are not killed the disease spreads to a far greater extent; but there are many fallacies in this view of the subject. Would all those that have come in contact with diseased beasts become affected? I contend they would not. The number becoming affected would not be equal to the number destroyed, although, as a greater number would remain alive, a greater number would suffer from the disease as an epizootic.

That atmospheric agency has a powerful influence on man is evident from the prevalence of diarrhœa for two or three months last autumn, while its influence is strikingly exemplified in the sudden and general attack of disease in the potatoes. In the first, the long-continued heat of the season had excited the action of the liver; while the latter, in all probability, was induced by the sudden changes of the weather, the deluging rains, and the surcharged state of the atmosphere with electricity. Neither in the one example nor in the other can the cause be ascribed to contagion. Some may say that diarrhœa is dependent on the food used at that season of the year which may increase the tendency to the disease, and may in some cases excite it; but I think no one will affirm that the potato disease is not dependent on the state of the weather. That pleuro pneumonia and potato-rot are dependent on nearly the same causes is, I think, evident by the fact of their having appeared about the same time, and having varied in intensity nearly in the same proportion.

Some will contend that animals affected with pneumonia must so far produce an effect on other animals standing in the same byres with them, and I have no hesitation in saying, that, in the advanced stages of that disease, where the breath has become obnoxious, and in badly ventilated byres, the noxious breath will so far contaminate the air of the byre as to increase the liability of the others in such unhealthy byres; but place diseased beasts in well-ventilated byres, and it will be found that no infection takes place—in proof of which I may state a case. Nearly four years ago, Mr. Finnie of Swanston had purchased forty oxen, which were put up to feed in pairs, so as to be in contact in one long byre, and were chiefly fed on liquid food. The troughs were made with a slight inclination from one end to the other, in order to save labour by the whole being supplied from the upper end of the troughs, and thus so far the food must have been breathed upon by all the cattle as it passed along. After being put up to feed, some of them began to cough and

fall off their feeding. I was called to see them, and found several slightly attacked with pleu pneumonia, and advised that they should be sold. In all, twelve became affected out of the forty; but it is a curious fact that, although they were arranged in pairs, no two in the same stall became affected; and although when those that had become affected were sent off, and their places filled up by closing up the ranks with those that remained in the next stalls, without any preparation, and without any more becoming affected, the remaining twenty-eight were kept in the same byre for nine months, until they were sold off fat, and in sound health and condition. As in this case no means were adopted to prevent infection, it must be allowed that if the disease is propagated by contagion, it took no effect in this case. The animals had, perhaps, been exposed to the causes of the disease before being purchased, and although the byre was well-ventilated and kept clean, this was insufficient to prevent the development of the disease in those contaminated, though operating to protect those that were in sound health.

In the year 1848 and early in 1849, Mr. M'Callum, a farmer within 3 miles of Edinburgh who kept a dairy of between 20 and 30 cows, suffered severely from the disease, and notwithstanding everything that I could do it still continued. The byres were badly constructed, being ventilated only by holes at the cow's head, and not drained. I was convinced that nothing but a reconstruction of the byres, with proper ventilation and drainage, would prevent the disease; and having made a statement in writing, which was laid before the proprietors, my suggestions were carried into effect at a considerable expense, and for about 8 years *not a case* occurred, although the disease had never left other byres in the neighbourhood. In the end of 1856, and beginning of 1857, the disease again made its appearance, and I was requested to investigate the cause. I was naturally much disappointed at the recurrence of the disease in a place where my suggestions seemed to have proved so effectual. On visiting the steading, however, I perceived what appeared to me to be the cause. In one of the byres, where I found two cows recently attacked with the disease, there were three large ventilators with luffer-boards on the ridge of the roof; one of these I found had been stuffed up, while the tiles had all been carefully pointed with lime in the end of autumn so as to make the byre more comfortable during winter, and part of the roof towards the ridge, which had formerly been left open between the tiles to increase the ventilation, had been closed. On a level with the floor behind the cows, there were two ventilators, one of which was closed, while the other was by no means so clear as it ought to have been; added to this, the drain had become choked up, and thus the former state of the byre was in a great measure restored. But it is satisfactory to know that since attention has again been directed to the causes these removed, scarcely a case has occ and those chiefly among the cows at grass— as it were, demonstrating some of the cau and the means of preventing, the disease.

I have already stated that exposure in without proper shelter may cause the di In like manner cows, standing in byres there are strong currents of air or drafts th them, readily become affected, an exam which occurred about 4 miles south from Mr. Bannerman entered to the farm of Muir in 1841: the steading had been recently er with a byre for 40 cows. In March, 18 disease broke out, and by the end of May h 24 cows, and during the next six or seven he lost 150. As the new byres had prov healthy, I was requested to visit them, and sider what could be done to check the di I found the steading built on a northern acc and the byres exposed to the north and ea doors opening in these directions, and th dows all round, the consequence of whic that strong draughts of air were almos stantly blowing through the byre, so t lighted candle was readily blown out. were no divisions to check these current the place was found to be very unhealt pointed out what I believed to be the and by putting up partitions, *dividing th* into compartments for 16 cows in each, gulating the ventilation, the disease was c to the extent that he had only a few to s and these, it was considered, had been n less affected by the state of the byres p to the alterations. But he further foun although much good was affected by the vision of the byre, even in that state, filled, it was not free of the disease, and, two empty cottages on his farm, he co them into two byres, and by placing his bought-in cows there for a time, and by ing up the byres to the full extent, the was completely checked, and he is satisfi although he lost in all 174 cows, the di not contagious. Circumstances having o to prevent his being able to attend to hi he has given it up—not, however, from of the disease.

Striking illustrations of a similar kind in the case of Mr. Davidson of Dean Pa during the autumn of 1845 and early 1846, and again in 1849, lost a great ma After I had tried what could be done by treatment, combined with tempora y i ments and alterations in the byre, I sati self that drafts were at least in a great the cause of the disease, and Mr. Dav length made such improvements as have prevented it. Mr. Weir, a neighbouring in consequence of the ventilation not been carried out in all parts of the stea 150 cows. He had his byres partially ve and the disease was checked, but it has some degree returned. In his case there

ventilation. In Mr. Davidson's byres there too much, very clearly showing, as I have dy stated, that the disease arises from ex- re to drafts and currents of air, and to a t of proper ventilation and drainage; and consider these cases are of importance, as trating the causes of the disease, I have re- ted Mr. Davidson to state in a letter his own unt of the cases, which I subjoin. In this ment it will be observed that there are some s which would go to prove that the disease been communicated by contagion; but in pinion they have an opposite tendency. It ted that in 1845 he bought a cow in the burgh market, which turned out to have o pneumonia; that after lingering for *more six weeks*, without his being aware of the e of the case, others became affected, and, isease rapidly spreading through his cows, in weeks thereafter they were all affected. no doubt, at first sight, looks as if the dis- had arisen from contagion; but when we der the length of time the disease had ex- in the byre before any effect had been pro- , and when it is known that the disease uddenly increased all over the country at eriod, it will at once be seen that a strong e of doubt is thrown over the subject. again, it will be observed that Mr. David- for the next three years, had had occasional These he considers to be of spontaneous : but it is evident that others may infer notwithstanding all his precautions, the of the disease had still existed in his byre, at the disease was only arrested by sending nce those cows that became affected. And gain, in 1849–50, another diseased beast troduced into his stock, and the disease time spread so rapidly that he was at induced to try the effect of improved ar- ent of the byres, with proper ventilation ainage; but I shall here allow him to give n statement of his case.

EAN PARK, BALERNO, 11th June, 1857.

SOR DICK.

Sir,—As requested, I proceed to give result of the alterations on my byres. yre originally was 83 feet long, and 24½ e, inside measurement, and fitted up for le, having an opening or bole opposite uble trivace or stall for the purposes of ng food, light, and air, to the cows from . The byre stood longitudinally about st and south-west, having one door in t to the south-east, one in the back to th-west, and one in the end facing the st. The roof was closely covered with here was a gangway up the centre of the d the cows stood on each side of it with ads to the wall. From their being so enings in the walls, and none in the re were many cross drafts of air; and wind blew strongly from the south-west s a current of air through the whole length of the byre. We had no pleura among our cows previously to 1845; but there were frequent colds, and weeds or inflamed udders, occasional attacks of murrain, and that, too, without any traceable infection. And when any sudden and severe change of weather took place there was an immediate falling off in the supply of their milk—this falling off telling, with almost barometric precision, the change in the atmosphere—and all plainly traceable to the cross currents of air through the byre to which the cows were exposed.

About the year 1845 I bought a cow in Edinburgh market, which turned out to be affected with pleuro pneumonia. It was a lingering case, lasting upwards of six weeks without my being aware of the nature of the disease; and at the end of that period the disease attacked one or two of the other cows, and spread so rapidly that, within other three weeks, every cow I had was affected, and the whole either died or were sold off the premises, as I wished the byre thoroughly cleaned before buying in a new stock.

The byre then stood empty some time, was thoroughly cleaned from the roof to the causeway, and repeatedly washed with hot lime, and chloride of lime. And after I thought all danger of infection was removed, a fresh lot of cows was bought in, not in public markets, but privately, and from stocks known to be healthy; but, notwithstanding all our precautions—and we could trace no cause for infection—we had in the course of the next three years ten or twelve separate cases of pleura; which, however, never spread among the stock, as the diseased animal was at once sold off on the disease showing itself. These occasional cases of pleura, as well as the frequent colds, and weeded udders, to which the cows were then subject, I attribute entirely to the currents of air to which the cows were then exposed in the byre—together with, perhaps, a predisposal of their systems to this disease—as I *knew* it was not communicated by infection.

About the year 1849 I again unfortunately bought a diseased cow, which stood undetected for some considerable time among the rest. Almost every beast I had took the disease, and I lost heavily. After again consulting with you, and trying the effect of a temporary subdivision of the byre by straw partitions as you suggested, I resolved to try the effect of altering and subdividing the byre into four divisions or byres, completely separated from each other by stone partition walls, each byre having one door and one opening window, and the whole being thoroughly ventilated by an opening on each side of the ridge of the roof, and extending the whole length of the roof, through which a constant stream of foul and heated air ascends, and a constant supply of pure and cool air descends, to the manifest comfort of the cattle, and at the same time without exposing them to any cross draughts of air. The drainage was also improved.

Since these byres were so altered we have not had a single case of pleura nor murrain, and very few cases of weeds or inflamed udders, and little fluctuation in the supply of milk from the changes in the weather. For the last eight years a fresh stock of cows has been every year bought in, not in the public market, but out of perhaps twenty different byres, over a wide district of country, and almost every one of them has been sold in prime health and condition.—Yours truly,

GEORGE DAVIDSON."

In the end of October, 1856, from 30 to 40 young cattle, belonging to different farmers, had been grazing during the summer on Irvine common; one of them was seized with pleuro-pneumonia, and died. The owners were afraid of infection, and knew not what to do, as the time had come for taking the cattle home. After consultation, Mr M'Call, V. S., was requested to examine them; he found them free from disease, and after they had been home not one of them became affected.

In the same month, a person of the name of Campbell, at Irvine, kept three cows; one took the disease, and died; another was seized, but recovered; while the one standing between these two was never affected.

I shall conclude my remarks on the contagion or non-contagion of pleuro-pneumonia by the following communication from Mr. Hunter, who gives his experience on the subject.

"THE HAUGH, 18th November, 1857.

DEAR SIR,—I beg, in accordance with your request, to send you a few notes of my experience of pleuro-pneumonia. The first case I ever saw occurred about 12 years ago in a lot of young cattle of my own breeding. They were grazing in a field by themselves, and had never at any time come into contact with any other stock. Where *infection* could possibly come from, I never could conceive, as at that time the disease was unknown in this district; but one after another was seized at short intervals, till three of them died. The others were kept on, and continued perfectly healthy. The disease made its appearance amongst my feeding-stock in the ensuing winter, and during that and several succeeding seasons I suffered very severely. Curiously enough, my *immediate* neighbours had not a case for a considerable time after it got a footing here, whilst some others, at a few miles distance, were as bad as myself. From all I could observe regarding it, I became convinced that the disease was not infectious, and, acting upon this belief, when many of my neighbours were taking all manner of precautions—whitewashing, &c.—some of them even going so far that they would not enter my courts for fear of carrying infection to their own, I continued to pursue uniformly the same course as I had done before it made its appearance. By and by, in spite of all precautions, it found its way into the other stocks round about, and they suffered as much as my own had done.

I never could say whether court or byre ing was the more favourable for its develo as it used to skip about from one to the up and down, both in a manner altogethe plicable, sometimes confining its attacks lot of cattle, and again wandering, appa at random, through them all. Whenever was observed in the byre, the animal w off, and another put in its stall, without fumigation, washing, or even removing t nips the diseased animal had been eating. I did very frequently, pretty much by experiment, and *in no case* could I eve any bad effects to having done so. One strong case I may mention, which mo firmed me in my practice. In 1846, cattle suffered so severely at grass that mined to sell off the remainder, and wh ing a lot to replace them, the salesman that they belonged to a friend of mine, disposing of them because so many of th gone with disease, and he could not p into my hands without warning me. T the agent for his candour, I bought th and put them into a court, with only a w ing them from another lot. I had not of those two lots a single case of disea visits for some seasons past have been c tively rare—occasionally a whole winter without a case. I generally graze fro 40 cattle at my farm on the Pentlands, a of late I have had a few cases. This bought three lots, which were sent up ent times. One lot of 10 became affec four of them were sent off, though g adjoining fields, and occasionally mixe of the others showed any symptoms. T herd's two cows took decidedly ill, recovered. I have now upwards of 80 various kinds, all of which, with the e of *one* more out of the 10 above notic has been sent away, have hitherto kept A small Shetland cow, which has be quite alone all summer, I may mention, ill some time ago, but, with some med ment, was brought through. I will b find that the preceding proves of any u and if I can furnish any further infor is heartily at your service."

[To be concluded in next number]

Artificial Manures.

BY PROF. ANDERSON, GLASGOW UNI

(Continued from page 465.)

Such differences, of course, can tected by complete analysis; but if i desired to ascertain whether or not genuine without determining its exa it is possible to arrive at this inform out a complete analysis, and it ha tomary to rely on such simple tests, omit altogether any means of asce purity. Hitherto the general run

os, though varying considerably in quality, all been remarkably free from sand and foreign matter; and when directly im- d analysis has been less important than ther manures, the more especially as dif- es in quality are not recognised as modi- the price. It is probable, however, that r attention will require to be paid to this in future. A case has recently occurred ch a cargo of guano said to be questiona- irect importation from the Chincha Islands und to contain in some parts as much as cent. of sand, and only 11 or 12 of am- Should this turn out to be actually the hen much greater vigilance will be neces- nd no one will in future purchase a Peru- ano without analysis. The investigation e case to which I refer is not yet complete; nderstand there is little doubt about the d from circumstances which have come knowledge, there is reason to suspect that l similar cargoes have been imported.

hstandlng these differences, however, it e admitted that Peruvian guano is distin- d from all the other varieties of that name ertain degree of uniformity, so that, as- it to be genuine, the chances are that chaser receives value for his money. But e is very different with the other kinds of These differ not only in composition eruvian guano, but are obtained in most es from small and shallow deposits, so ferent cargoes, and even different parts same cargo, differ to an extraordinary The farmer therefore, can place no re- on their uniformity, but every cargo re- o be separately examined. Still less can upon the name given them. When we Peruvian guano, we always think of that from the Chincha Islands. But Chilian, nian, and Bolivian are names applied to s found at different places along the coast countries of even several hundred miles nd which have not the slightest resem- n composition. All other guanos differ ruvian in regard to the quantity of am- hey contain. Peruvian guano, from its een deposited in the small zone in which er falls, retains almost undiminished the a existing in the dung of the bird; but her localities rain has produced a greater fect upon the manure, causing the more omplete decomposition of the organic ous parts, which, along with the soluble matters, is wasted out. It is then possi- e in the samples from different locali- radual passage from guanos like Peru- n in ammonia, until we arrive at those ve been so long and thoroughly exposed eather that little more than traces of tance remain. In consequence of the of these substances, the phosphates have be the largest and most important con- of those guanos, which are commonly hed as phosphate guanos. But the difference does not stop here; not only do these guanos often contain a considerable quantity of sand, due no doubt in part to the subjacent sand being sifted along with it when it occurs in thin layers, but they often contain carbonate and sulphate of lime, and sometimes oxide of iron. The mode in which these substances find their way into these guanos is not well understood, because the localities have never been examined by scientific men; but they are not adulterations, that is to say, they have not been deliberately added to the guanos, although of course they necessarily diminish their value. The composition of guanos other than Peruvian is so variable that I shall not fatigue you with reference to numerical details. I shall content myself with observing that the analysis of such guanos are made out in exactly the same manner as that of Peruvian, with the addition, however, of the constituents which they often contain. In reading the analysis, reference must in the first instance be made to those substances, and their amount, together with that of the sand and water, being added together, you get in the first place the total quantity of worthless matter. In the next place, attention must be directed to the quantity of phosphates; and it is necessary to bear in mind that in guanos of this description from a-half to five-sixths in their value depends upon the quantity of phosphates they contain; while the ammonia, especially in guanos like Saldanha Bay, Patagonian, Chilian, &c., is comparatively unimportant. Little difference is found in the mode of expressing the analyses of guanos, almost all chemists being agreed as to the system to be employed. The only difference is, that occasionally the phosphoric acid in the alkaline salts is written in the body of the analysis; occasionally also the phosphates of lime and magnesia; but such differences cannot occasion any difficulty.

It sometimes happens, however, that analyses are seen with such items as phosphate and carbonate of lime, sulphates of lime, potash and soda. The analyses with such heterogeneous items should be unhesitatingly rejected. They are entirely worthless, and in place of affording the means of forming an estimate of the value of the manure, are only calculated to mislead and confuse the purchaser. When we turn to the analysis of a super-phosphate, many questions present themselves to us for consideration, dependent on the fact that these are manufactured manures, and that their composition depends to a great extent on the nature of the materials employed in making them. It will be understood that the term super-phosphate was originally applied to a mixture of common bones and sulphuric acid, and therefore strictly merited the name of dissolved bones originally applied to it. The introduction of coprolites, and more recently of apatite and various other phosphates, has rendered the wider designation necessary. The use of these substances has also entailed further differences in the mode of manufacture, sulphate of ammonia, flesh, fish, offal, and vari-

ous other animal substances being used to supply the nitrogen in which these materials are deficient. The consequence of this is that the greatest possible differences exist in the composition of this manure, so much so that the product of no two manufactures is exactly alike, and very often owing to variations in the quality and quantity of the different raw materials, dictated of course by economic considerations, samples obtained at different times from the same manufacturer show a remarkable want of uniformity. The difficulty of understanding the analyses is necessarily enhanced by these differences, and still more by the discrepancies which exist in the mode of stating the results used by different individuals, which are very great, and, as I believe, the cause of much misapprehension. In order to render the analysis of a superphosphate intelligible, it is necessary to explain that in the bones and all other similar substances the phosphoric acid is in combination with lime, and the combination is entirely insoluble in water. But there exists another compound of these substances, containing only the third of the lime, which is exceedingly soluble in water, and which is commonly known by the name of biphosphate of lime. When, therefore, two-thirds of the lime is removed from the former, it is converted into the latter, and this is effected by means of sulphuric acid, which, by its superior attraction for lime, withdraws it from the phosphoric acid and forms with it a quantity of sulphate of lime or gypsum. We find also by actual experiment that 100 parts of the ordinary bone phosphate of lime contain 46 of phosphoric acid, and by removal of the lime it is converted into 64 parts of biphosphate of lime, still containing all the phosphoric acid, the difference in weight being due to the abstraction of the valueless lime, which along with sulphuric acid has produced 110 parts of gypsum. By the addition of a proper proportion of acid to bones or any other raw material the whole of the phosphates might be converted into this compound, but practically great difficulties are encountered in doing so, and in the case of raw bones it cannot be accomplished. Nor is this a matter of much moment, because experience has taught us that it is not desirable to do so, but that it is preferable to have a proportion of the phosphates in their original insoluble state. It will be understood from what has been said, that in the act of making the phosphoric acid soluble a quantity of sulphate of lime is produced and it is important to notice this point, because it is very commonly believed by farmers that the sulphate of lime which forms so large a constituent of all superphosphates is deliberately added to them by the manufacturer. This, however, is a mistake. I believe sulphate of lime is very rarely added to a superphosphate, and that the efforts of the manufacturer are devoted to keeping it down as much as possible, because it is well known that a large proportion of it excites suspicion and distrust on the part of the farmer. It has been already said that it is impossible to obtain any great quantity of s phosphate of lime without at the same time ducing 1½ times as much gypsum, but in tice the proportion is generally much larger this, because almost all the raw materials ployed in the manufacture contain a conside quantity of carbonate of lime or chalk, by the action of the acid is also converted sulphate. This is particularly the case wi prolites, and the consequence is that it from uncommon to find the gypsum 2 or 3 as large as the biphosphate.

The learned Professor then referred t valuation of manures; he said—The best m of deducing from the analysis of a man fair estimate of its money value is a pr problem of much importance, which has a ed the attention of many persons and sev these differing in detail though similar in ple, have been contrived. The difficulty attends the contrivance of a system whic be altogether beyond cavil, and on wh persons can be at one, lies in the comp ture of most manures, and the number o ent factors of which their value is made the case of a substance such as sulphate monia or nitrate of soda which has a market price, the value of different sam easily and clearly ascertained, and the de now made for any given amount of imp estimated in a manner which requires n nation. But when a substance is of c constitution and owes its value to severa ent constituents, it is necessary to have rate estimate for each of these, which deduced from the commercial value not particular complex mixture but from other substances of which each of the constituents is met with separately. N happens that the commercial value of substances is not estimated solely by c tions of composition, but questions of and supply and applicability to various have an important influence. Thus, f ple, a coprolite containing about 60 pe phosphates sells for £3 10s. a ton, while phosphatic guano containing the same brings from £6 to £7, in other words, phates in such a guano bring nearly t price they would do in coprolites, and t is obvious: in the one case they are in tion such as to admit of their direct ap to the soil, while in the other they mus dergo an expensive preparation. In way if our inquiry was the price of bon find the value of the phosphates int between that of coprolites and guano we go further and inquire into the mar of different kinds of guano we find tha of the phosphates contained in them d very extraordinary extent. This is d to the fact that the price charged for is estimated commercially at such a r cover the expense of freight and othe and to leave a profit to the dealer, an

ssumed that the purchaser will not pay these es unless he on the other hand has satisfied self that he also can clear a profit from the saction, and partly also to the carelessness which manures are often purchased and the t of careful comparison of the relative pro- derived from different substances. Another ent which must also be considered, we have dy referred to, in the state of division of ubstance, the extent to which its different tituents are available to the plant, the faci- ith which it can be applied to the soil, &c. e considerations are of great importance e many different substances are compared, hey are not likely to be of much moment in ase of strictly analogous substances, such, xemple, as two different kinds of guano be- ng to the same class, and it must be admit- at in these cases no good ground for the ence in the prices given can be shown, and uld in all probabillity disappear if more tion were paid to the results obtained in the

The more minutely the subject is in- into the more obvious does it become o system of valuation can be made per- general, but that each individual kind of re requires a plan suited to itself alone. however, involves such difficulties and ications that an attempt has been made to general system which, though not abso- correct, is a sufficient approximation, and, st, a satisfactory guide to the relative of these sulphates. In purchasing a ma- he substances which are of actual value mmonia, insoluble phosphates, soluble ates, sulphate of lime, nitric acid (as of soda), potash, soda, and organic mat- hese different substances in their substan- er greatly in value. Ammonia and the ates soluble and insoluble are costly, and the greater part of the value of all the n manufactured manures depends on Potash also sells at a high price, but it y found in manufactured manures, and in sufficient quantity to influence their and it is not customary to take it into ration except in particular cases. The ost commonly found in artificial manures and when alkaline salts are stated in an ; they must be assumed to consist almost of that substance, and be valued accord- Sulphate of lime and organic matter, abundant constituents of most manures, little to their value, and some persons nclude them in their estimate, although e common practice is to make a small ce for them. In order to obtain a fair r each of these substances, it is neces- ascertain the commercial prices of each ly. This, however, cannot be done in , and it is necessary sometimes to arrive an indirect process, in the manner which fterwards explained. The question we solve is the price actually paid for a ch of these substance in a pure state, and we shall consider each in succession. Insoluble phosphates are purchased in several different forms. Coprolites ground to a fine powder and containing 58 per cent. of phosphates sell at £2 12s. per ton, and a ton of pure phosphates is consequently sold for £4 8s. In this state, however, the price is extremely low, because it is alleged that the phosphates are in so compact a condition that the plant cannot avail itself of them, and they are only used as a raw material for the manufacture of superphosphates. Bone ash, containing 70 per cent. of phosphates, costs £4 10s. per ton, and pure phosphates in this form are therefore sold at £6 8s. These are the principal forms in which phosphates are sold alone, but it is possible to calculate the value they bear in bones by deducting that of the ammonia they yield from their price, and assuming the remainder to refund the price paid for the phosphates; a similar course may be adopted with phosphatic guanos, and we then find that a ton of insoluble phosphates is worth in

Coprolites,	£4 10
Bone ash,	6 8
Bones,	7 5
Phosphated guanos,	10

These then are the actual market price, and they differ to a very great extent; and the farmer who purchases a phosphated guano pays for the phosphates much more than he could obtain them for in other forms. This difference is to be attributed to the higher state of division in which they exist in the guano and their consequent accessibility to the plant. We are bound then to estimate the value of phosphates in such guanos at this price, although as ammoniacal guano, such as Peruvian, they are sold at a lower rate, but for all other manures of which lime and bone ash form the basis £7 per ton may be taken as a fair rate and it is that which has been usually adopted, although £8 and even £10 are sometimes assumed as the general price. *Ammonia* is found in commerce in the shape of sulphate of ammonia, which at present sells at from £15 to £15 10s. per ton, and making allowance for the ordinary amount of impurity (5 or 6 per cent.) the price of ammonia in this form is about £63 per ton. By calculating from the price of other substances it appears that the following are the values of ammonia per ton;—

Sulphate of ammonia,	£63
Bones,	61
Peruvian guano,	57

The general average being £60 per ton, which is the price usually adopted. *Sulphate of lime* sells for about £1 per ton, and this value is accordingly always adopted. Considerable doubt exists as to the propriety of allowing any value for the organic matters in manures, because it is supplied in farm yard manure in so large quantity as to make the few pounds contained in an ordinary dressing of artificial manure unimportant. It is customary, however, to sell at from 10s. to £1 per ton, and I shall adopt the lower

estimate. *Alkaline salts,* consisting chiefly of soda, are taken at £1 per ton; and potash at from £20 to £30, the former being the price at which it can be procured in Kelp. *Nitrate of soda* is at present sold at about £14 per ton, or if allowance be made for impurities, the price of the pure salt is about £15. Considerable difficulty attends the estimation of the value of soluble phosphates, because they are not met with in commerce alone or in any form except that of superphosphates, and the price at which they are sold in different varieties of that manure and by different manufacturers varies very greatly. The only course open to us is to endeavour to determine the average price and composition of good superphosphates, and putting the values already determined on all the other constituents, to reckon the difference between that sum and the *market price,* as the value of the soluble phosphates. I find that throwing out all the inferior samples, in those containing less than 10 per cent. of soluble phosphates, and taking the good only, the average composition of the superphosphates in the market during the present year has been:—

Water,	10.71
Organic matter,	9.33
Biphosphate of lime, equivalent to 19.43 soluble phosphates,	12.45
Insoluble phosphates,	14.78
Sulphates of lime,	45.24
Alkaline salts,	2.11
Sand,	5.38
	100.00
Ammonia,	1.71

It is more difficult to determine the average price at which the manure is sold, but the samples analysed included manures at all prices from £7 per ton up to £10 and in some cases even £10 10s. On the whole it may be assumed that the average price is about £8, and if so, soluble phosphates are sold at £27 19s. per ton. If the inferior samples had been included so as to give one general average, the price would have been still higher. The usual price at which they are estimated is £30 per ton, and £46 16s. for biphosphate of lime, although occasionally the former has been reckoned as low as £25, with a *corresponding* rate for the latter. All these prices are liable to fluctuation according to the state of the market, and they ought to be varied at different times; but it is obvious that the farmer cannot watch the changes of price so as to do this, and it is much more convenient and safer to adopt a fixed average which can be used for the comparison of different manures. Indeed, if absolute precision were to be aimed at it would be necessary to vary these estimates in different localities, and to some extent also according to the kind of manure. This is particularly the case in regard to the price of soluble phosphates, which is actually fixed by the manufacturers of superphosphates, and in this respect very remarkable differences are observed, for in superphosphates made from bones it is by no means uncommon to find soluble phosphates sold as high as £40 per while in those made from bone ash and their price sometimes does not exceed £20. the same way we find that in soluble phosph which in bones and bone ash are sold for £7 per ton, cost £10 in phosphated guano that a different value must be establishe these substances in their different condition may, indeed, be alleged that no such diffe is admissable, and that the lowest price s in all cases be assumed; but on the other it must be observed that the whole obj adopting a system of valuation at all is means of deducing the market price of t ticle and the values used when applied average sample must bring out the ar price. Hence when a farmer buys a phos guano at such a price as gives £10 per t the phosphates, we are not entitled to s he has paid too dear, and that he ought t got them at £7 per ton, the rate at whic are purchased in bones. On the contra are bound to assume that he would n paid this price for them unless he foun his advantage, and to make it the basis valuation. It is sufficiently obvious th values of the different substances conta manures being a matter of deduction, c able differences must exist in the values a to them by different individuals, and w fore give a table shewing the values per adopted by different analysis:—

	Way. £. s.	Voelcker. £. s.	Nesbit. £. s.	Hodg £.
Ammonia.....	56 0	60 0	60 0	56
Insoluble phosphates	7 0	10 0	8 0	7
Do. in phosphatic guanos..	7 0	10 0	8 0	7
Soluble phosphates	32 13	30 0	24 0	25
Biphosphate of lime	50 3	46 16	37 8	39
Alkaline salts.	1 0	1 5	1 0	1
Sulphate of lime	1 0	1 5	1 0	1
Potash.....	30 16	—	—	20
Nitrate of soda	—	20 0	—	-
Organic matter	1 0	1 0	1 0	1

The practical application of these valu simple, and will be readily understood examples. Let us suppose a sample phosphates to contain—

Water	
Organic matter	
Biphosphate of lime equivalent t 14.88 soluble phosphates	
Insoluble phosphates	
Sulphate of lime	
Alkaline salts	
Sand	
Ammonia	

bvious that the percentages must represent umber of tons of each constituent in 100 f the manure, and the value is calculated following manner:—

Tons of organic matter at 10s. per ton,	£7
" soluble phosphates at £30 do.	446
" insoluble phosphates at £7 do.	105
" sulphate of lime at £1 do	39
" alkaline salts at £1 do	4
" ammonia at £60 per do	128
	£727

quently the value of one ton is £7 5s. An e Peruvian guano calculated in the same r gives—

Tons of organic matter, at 10s. per ton	£26
" insoluble phosphates, at £7 do	161
" phosphate of lime and the alkaline salts, at £30 per do..	150
" alkaline salts, at £1 per do...	8
" ammonia, at £60 per do.....	1020
Value of 100 tons.....	£1365

he rate of £13 13s. per ton. It appears, re, that, as compared with other manures, an guano is a cheap manure. It must be tood, however, that this system of valuaves only an approximation to the price, estimating it exactly many other matters e taken into consideration, more es- in the case of manufactured manures. these the condition of the manure is of hest importance. A damp, ill-reduced must not be valued at the same rate as ully manufactured sample, which has been t into a high state of division, and the r must exercise his judgment in this matl diminish or add to the value to such an as he may consider right under the circes. In the same way the proper adt of the relative quantities of the differstituents must be taken into account. or example, if there be two samples of osphate having the following composi-

	I.	II.
r.....	12·72..	11·83
nic matter.....	5·66..	3·82
osphate of lime.....	10·77..	21·30
valent to soluble phostes.....	(16·82)	(33·44)
uble phosphates.....	19·21..	2·59
ate of lime.....	48·99..	54·13
ine salts.....	0·11..	2·23
.....	2·54..	4·10
	100·00	100.00
onia.....	0·32..	0·37

alues of these two manures be calculated g to the plan just laid down. No. 1 is orth £7 per ton, and No. 2 £11, but the value of the last is by no means so cause it is found that the conversion of le of the phosphates into a soluble form is not attended with commensurate advantage in a manurial point of view, but that the best results are obtained when a reasonable proportion is left insoluble. In point of fact a manure like No. 2 is sold at from £8 to £8 10s., which may be considered as its proper value. These and similar matters must be borne in mind when selecting a manure, and form an essential element in the estimation of their value, and it must be understood that the per centage valuation must always form the basis of any system used, and it is only modified by these secondary considerations. The necessity of properly apportioning to one another the different constituents of a manure is obviously attracting the attention of manufacturers, and the number of superphosphates made from phosphates alone has recently undergone a considerable diminution, while those of which ammonia forms a large constituent are on the increase. The sum of what I would impress upon this meeting is,—

In the first place the most important matter for you to attend to in purchasing manure is to see that the seller supplies the farmer with an analysis of the manure, stating exactly what its composition is. The farmer, then, after examining this manure and calculating its value, according to the system which I have been explaining, should ascertain whether he receives value for his money, according to the analysis which was given him. He has next to ascertain whether the manure has the composition which the seller professes it has. Now, no reliance can be placed upon the uniformity of manures. In the produce of various manufacturers great differences are observed, and the reason is very obvious and very simple. Manure is a cheap article which will not admit of that amount of expenditure in the shape of labour which insures uniformity. The manufacturer must use a rough-and-ready process, and the consequence is he cannot ensure an absolute and complete uniformity. Even if you take four or five specimens of the same manure by the same manufacturer you will find that it differs very much in its composition; but if you take a small quantity from different bags and mix them all together you get a general average which, being the make of a good manufacturer, will turn out to be tolerably uniform. A sample, therefore, should always be selected from a few different bags, properly mixed together, and also the composition should be determined.

Further, the farmer is to ascertain that the analysis he receives is properly made. This is a point which he cannot be expected to understand for himself. There are no external indications in the analysis which can tell him whether it is rightly or erroneously made. He can judge, however, to a certain extent, in this respect, that all careful chemists ought to have pretty nearly a uniform system; and if he find any mistake he has a right to suppose that the results cannot very much be depended upon. If he attend to all these matters, and if, above all

other considerations, he attend to the character of the individual with whom he deals, he has a chance to secure uniformity; or at all events—which is most important—he should have all his wits about him. The data which I have given you as to the extraordinary consumption of these artificial manures, and the extent to which we are dependent upon them, will show how much the farmers may be misled if they do not take care to use the proper means of arriving at their composition. A reduction, for instance, of 10 per cent. in the value of these manures is equivalent to a sum of £400,000; and you may also readily understand how easy it would be to adulterate an article some 10 or 20 per cent., and the difference never be observed. (Loud applause.)

Entomology.

ADDRESS ON THE CURCULIO AND BLACK KNOT ON PLUM TREES.—BY ASA FITCH, M. D.

Entomologist to the New York State Agricultural Society.

Mr. President and Gentlemen,—The Curculio or Plum weevil and the black-knot excrescences on plum and cherry trees having been prominent in my investigations since I last addressed you, I have thought that these would be as interesting as any subjects I can select, on which to speak at this time. I am the more induced to make the Curculio a prominent topic of the present lecture, since no particular account of this important insect has yet been given in my Reports on Noxious Insects, and may not appear for a while to come, for the reason that I aim to introduce nothing in those reports which has not been authentically ascertained by actual observation, and an important portion of the yearly life of this insect is yet remaining undiscovered and a subject of speculation and conjecture.

I am inclined to rank the Curculio or Plum weevil as the most important and most injurious insect which we have in our country. Although the Wheat midge is at the present period causing a much greater amount of pecuniary loss than this insect, I cannot but think that its career will be analagous to that of its predecessor, the Hessian fly, and that it will therefore in time become so fully naturalized and mastered by its parasitic destroyers, that it will cease to be the formidable evil which it now is. Unlike the Wheat midge, the Curculio is a native insect of our country, which has now been known upwards of a century, during all of which time it appears to have gradually multiplied and increased its forces, without any cessation or interval in its ravages. At first, in the correspondence between the botanists Collinson and Bartram, in the year 1746, it is spoken of as destroying the nectarines in and around the city of Philadelphia, whilst the plums, it is said, were but slightly molested by it. But after a time it took the plums also. As an evidence of its steady progress and increase during the forty years, I may state the fact, that in my boyhood, the wild plum trees in my own woods were often filled with fruit. But, though such trees are still growing in several of the old places, I have never since that time seen a single ripened plum upon any of them. And now, as it has become so multiplied that the plum no longer suffices to accommodate it, and it therefore attacks our cherries and apples also, and a large portion of these are every year blighted or destroyed by it.

As already intimated, this insect and its habit of destroying young plums, has been known in our country for more than a century. But formidable an evil is it, that communications without number in relation to it, and remedies for its destruction, have appeared in our agricultural periodicals and other publications, one would hence think that everything relative to the habits and economy of this insect had been observed and made known to the public. This, however, is very far from being the case. Notwithstanding the volumes that have been written upon it, we do not to this day know where the Curculio lives and what it is doing during three quarters of the year. All that is currently known respecting this insect is substantially as follows. That it is a small grayish brown beetle, which makes its appearance on plum trees when the young fruit is about a third or half-grown, cutting a curved or crescent-shaped slit on one side of this fruit, and dropping an egg into the wound—from which egg a small white grub hatches, which burrows in the fruit, causing it to wilt and fall from the tree—whereupon the worm crawls into the ground, to repose for three days during its pupa state, when it comes out again, the latter part of July, a beetle like that which six weeks before laid its egg in the fruit. What becomes of it from this time till the next June is wholly unknown. And that it breeds elsewhere than in the young fruit, as stated by some, is doubted and denied by others.

My own observations lead me to believe that what is currently known and supposed to be the main and essential part of the history of this insect, is in reality but a small part of its life—but a mere incidental act—an episode on the main life and operations—and if there was no young fruit whatever, this creature would continue in existence without being sensibly discommoded by the want thereof. I will, therefore, proceed to state the facts relating to this insect, first as they are at present known to me, and the inferences to which these facts lead me.

First, however, let us notice the insect itself. On taking one of them in hand and closely inspecting it, it is observed to lie perfectly still and motionless as though it were dead. It is seen to be a small, hard, uneven, oval beetle, shaped somewhat like a pea, its head part being narrower than the main part of the body. It varies greatly in its dimensions

e males or smallest individuals being but as large as some of the females; its medium ging somewhat less than a quarter of an in length. It is of a gray or rusty brown , varied more or less in different specimens spots of white, ochre, yellow, and black, in ular showing a shining black spot on the e of its back with a white spot immediately of it. Hanging down conspicuously from rward end, like the trunk of the elephant, a slightly curved beak or bill, of the same h and thickness as the thighs of the legs. beak is an appendage which belongs to all s of the weevil kind, and distinguishes them all the other beetles or hard-shelled insects. thus a true weevil, this insect has often ermed the "plum weevil," and it is to be ted that this has not become its current de- ion, it being so much more definite and ex- ve than the name "Curculio," which is the Latin synonyme of our English word , and is hence applied in science as the name of the whole group to which this s pertains.

t, at what time do these beetles come ', and where do we find them? I know w many articles in our agricultural peri- I can refer to, reciting the success of nt remedies which were applied, "when rculio first began to appear"—yet not one m specifying *the date*, whereby others know when the time has arrived to look

oubtedly to the south of us, in Pennsyl- nd Maryland, this, like all other insects, me abroad somewhat earlier than they do New York. And everywhere, they will mewhat with the backwardness or for- ss of the season in different years.

y own vicinity, fifty miles north of Al- his beetle has been found as early as the ng of April, though it is not usually met about the middle of May; and in a week ays afterwards it becomes common. It found standing or slowly walking upon k and limbs of the plum, cherry, apple, thorn apple, the butternut, and doubtless e other trees—though I name no others, g certain but it was accidentally present situations where I have captured it. The r of insects will notice that the specimens on butternut trees are always larger in n those he finds on cultivated fruit trees ting that they have been better fed dur- larva or growing period of their lives. m this time onward, till cold weather we continue to find these beetles abroad, ole season through. Late in autumn, flowers of the golden rod, they may with as plenty as at any earlier period of

ext—what do these insects do? As we t stated, they come abroad in full force, er the middle of May; and it is some hree weeks after this, or about the 10th day of June, that the young fruit becomes sufficiently advanced to answer their purposes. They then fall upon it, to deposit their eggs therein. They are decided epicures, being most fond of the choicest varieties of our fruits; hence the nectarines and all the best kinds of plums are most sure to be destroyed. But, as already stated, their numbers are now so excessively multiplied all over our country, that the plums fail to accommodate but a portion of them. Others, therefore, invade the peaches, pears, apples, and cherries, and others still attack the wild thorn-apples, making the same crescent-shaped wound in all these fruits.

It is in allusion to this crescent-shaped mark that this weevil is frequently termed the "Little Turk"—as it appears to delight in seeing this symbol of Mahometanism everywhere inscribed—as though the little imp was aware how annoying the sight of it is to us "Christian dogs."

This mark is scarcely the tenth of an inch in length, but is very distinctly to be seen wherever it occurs upon the surface of the young fruit. In apples, however, which are quite small and have a thin woolly coating, and are increasing rapidly in size when they receive this wound, it in a few days becomes so dried and healed that it usually appears to the eye as a mere discolored speck, which is probably the reason why it has been so much overlooked in this fruit. This mark is cut by the jaws of the insect, which are exceedingly small, and are placed in the end of the long beak or trunk of which we have spoken. And in addition to this crescent-shaped slit, the Curculio wounds the fruit by drilling holes therein with its beak, resembling punctures made by a coarse pin or needle. One or more of these punctures may be seen upon almost every fruit which it invades. It is probably for feeding upon the juicy pulp of the fruit that the insect bores these small holes in it; and, even where no crescent-shaped slit occurs, these perforations may be noticed, causing hard nurly dents to be formed in the fruit, which would otherwise be smooth and fair.

Usually only one of these crescent marks is made upon a plum or apple, though sometimes two, three, or more may be found. A single egg is dropped in each of these curved slits, and with its beak the insect crowds the egg deeply into the bottom of the wound. From this egg a small white worm or grub hatches, which is destitute of feet, like the larvæ of all the other weevils, and is about four times as long as broad, being thickest in its middle, and with a small, shining, brownish yellow head. This worm penetrates inward to the core of the young fruit, and there feeds around the stone or seeds, excavating quite a large cavity, which is partly filled with small brown grains, the castings of the worm.

From the attack of this worm, the plum, the apple, the pear and peach, wilt and fall to the ground, whilst the cherry and thorn-apple do not wither but continue to grow and ripen, though

so wounded, knotty, and deformed that the fruit is worthless.

And here let us pause for a moment to notice one of those curious paradoxes, with which the student in the works of nature is so frequently meeting.

A person, on being informed that of the two stone fruits, the plum and the cherry, the one perishes and the other lives—of the two pomaceous fruits, the apple and the thorn-apple, the one perishes and the other lives, when invaded by this worm—I say, a person, on being informed of these facts, would at once say: it is the smaller of these fruits, it is the cherry and thorn-apple, that wither and die when attacked by this worm, whilst the larger fruits, the plum and apple, will feel the same injury less, and will survive the wounds that kill the smaller fruits. But lo! exactly the reverse of this is the fact. It is the small cherry and thorn-apple that live and ripen on their stems; it is the large plum and apple, and also the peach and pear, that wither and fall from the tree! And on coming to consider this anomaly more fully, we clearly perceive that it is necessary that these things should be ordered and arranged just as we find them to be. The quantity of pulpy substance in the larger fruits is sufficient to feed the worm within them till it reaches maturity; whereas, should the smaller fruits wither in the same manner, the worm within them would die. It is, therefore, necessary that they should continue to grow, to elaborate the amount of sustenance which the worm requires to bring it to maturity.

But why it is that in these several fruits effects so dissimilar result from the same cause,—these effects, too, exactly the reverse of what we should expect,—we are wholly unable to explain. I can only resolve it into this, that in each of these cases the Author of nature has decreed that it shall be so, and therefore it is so.

Even though in a more advanced state of science the vegetable pathologist should be able to show certain peculiarities in the physical constitution of these trees, whereby it will be explained why it is that the irritation produced by the gnawing of this worm is speedily fatal to the one fruit, and not at all so to the other, it will only carry us one step further back and lead to the inquiry—How came these trees to possess their respective constitutions? Why did not the peculiarities of the cherry happen to be given to the plum, and thus produce a discord instead of that harmony which we now see?

And thus, wherever we fix our look in the wide domain of nature, whatever page we open in her "book of wondrous secrecy," we perceive unmistakeable evidence that, even in all its minutest details, the vast framework of creation has been arranged by a hand that was omnipotent, that hand guided by an intelligence that was infinite.

But to return from this digression. Any person on inspecting a large, thrifty plum tree at the commencement of June, on seeing the profusion of small young fruit which is every where interspersed among the leaves, would deem it all but impossible for an insect to devastate the fruit to the extent that the Curculio does. He would think that, here and there, at least, a plum hid among the foliage, or projecting out upon the ends of the slender twigs, would elude the search of this insect, and thus be left to ripen upon the tree. But I judge from what counts it is the same all over the country that is within the sphere of my own observation, although the trees are perfectly healthy and vigorous, richly clothed with verdure year after year, we never see a ripened plum upon the tree except where special care is taken to exclude this intruder.

And not only this fruit, but (what many persons are wholly unaware of) a large portion of our apples are also blighted by this same insect. I am persuaded it is one of the principal reasons why our orchards as this day are so much less productive than they were half a century ago. To obtain a correct idea of the intolerable evil which this insect is in our country, I hope every one who now hears me, if he has not already particularly noticed the sad spectacle, will bear it in mind next 4th of July, or within a few days of that time, to walk to the plum trees and apple trees of the orchards in his neighbourhood. You will find the ground under many, if not all, the trees literally covered with the wilted young fruit which has fallen from its having been blighted by the insect. Could but a fourth part of what is now on the ground have remained upon the tree to ripen, it would be such a yield from them as for a cycle of years we have never had and have ceased to expect.

On cutting open these withered plums and apples you will find the same worm in the one as in the other, or, if this worm has left the habitation of the fruit, its track will still be found therein, demonstrating that the falling off of the whole of the fruit, from both kinds of trees, has been occasioned by the same cause.

It is during the early part of July that the worms are leaving the fruit and entering the ground. But some are found still quite small after others have got their growth and eaten the fruit. Hence a considerable time, say two or three weeks probably, during which and another of these larvæ in the fruit arriving to maturity and entering the ground.

They remain in the ground reposing, in the pupa state, about three weeks. Hence those entering the latter part of July that the most rapidly complete their transformations, and come out again in their perfect state.

Thus, in from six to eight weeks from the time the egg is deposited, this insect passes its growth, and becomes a beetle of the same kind as its parent.

We thus have these insects completing their transformations and all coming abroad in their perfect state the latter part of July

ere is now no young fruit for them to resort . And the question arises—What do they now , and what becomes of them from this time l young fruit again appears the following ar? Where do they secrete themselves to pass winter, and in what stage of their lives are y at that time?

Our best authorities at this day give us as their inion on this subject that some of the larvæ ich are retarded in completing their growth, that they do not leave the fruit and enter the und till the latter part of July or later, re- in in the ground in the pupa state through autumn and winter, to produce the beetles ich appear the following spring. There are many improbabilities connected with this view the case, that I am surprised that an author intelligent on these subjects as was the late Harris gives countenance to this as his opi- n. Let us briefly look at this hypothesis. e temperature of the earth through the month August is greater, the ground is then warmer, n it is in July. There is no probability, refore, that an insect whose transformation er ground is completed in three weeks in y can remain in the earth a longer period in month of August. Least of all is it to be sup- ed that it can remain there unhatched through the warm weather of that month and autumn.

gain, we know that nearly the whole genera- of these insects that is nurtured in the ng fruit reaches maturity and comes abroad latter part of July. Now, is this vast army ese creatures merely an abortion—brought h only to perish? Is the existence of this ies left to the mere accident of a few indi- als happening to be retarded beyond the l time in entering the ground, and therefore aining in it till the following spring? This ld be an anomaly, wholly unlike anything h we meet with elsewhere in this depart- t of nature's works.

ithout stopping to notice other views that been advanced on this subject, it may be rved that the fact that these insects come ad in the spring in full force, some three s before the young fruit is adapted to their and that after the young fruit is gone, they till abroad as numerous as before, the pre- ition becomes very strong, that they must other places for cradling their young, in ion to the fruit. And the enquiry thus s, whether the Curculio is known to breed here than in young fruit. To this comes eply, that there is one other situation in h it is well ascertained they do breed with ty, to wit, in those singular excrescences lum and cherry trees, called black-knot. as the Curculio has so often been said to these excrescences, and the opinion is still tained by many persons that they are pro- by some other insect, if not by this, I may turn aside to give some account of this re- able disease, since, to ascertain whether it was caused by an insect or not, I have examined it more closely, perhaps, than had ever been done by any other person.

The black-knot excrescence is a disease peculiar to the plum and cherry trees in this country. It is a large, irregular, black, wart-like excrescence, which grows upon the limbs, causing the death of all the limb above it, and extending down the limb farther and farther every year till the whole branch is destroyed, other limbs at the same time becoming affected in the same manner, and also the limbs of other trees in the vicinity. If it is neglected, it in a few years kills the tree.

This disease commences upon the small limbs, the wood of which is but a year or two old. It is recognised at first by a slight swelling of the bark at a particular point, on the upper side of the limb, which begins in autumn and remains stationary through the winter. When the sap begins to circulate in the spring this swelling increases, rupturing the cuticle or thin outer skin of the bark, and continuing to grow and puff out till in June some inches in length of the limb at the place affected is three or four times its diameter elsewhere. The bark and portion of the wood under the bark are the tissues involved in this disease, both the bark and woody fibres being changed into a spongy substance, but not at all juicy like the fruit of a tree. This spongy substance is of a pale yellow color when growing, changing to coal black when it is mature; and then a minute black fungus plant, resembling the head of a pin, grows upon its surface. You will see, on looking at these black knots, that their whole surface is covered and crowded with little smooth black granules, which are the fungus plant alluded to. They are a species of the genus *Sphæria*, and are described by that profound botanist, the late Rev. L. de Schweinitz, under the name *Sphæria morbosa*. It is a curious fact that the surface of these excrescences, when mature, are always covered with this plant, which never grows, or at least has never been found, in any other situation.

There has been much speculation as to the cause and the true nature of these excrescences, they are so unlike anything else with which we are acquainted. Most persons suppose them to be of insect origin. The larvæ of the Curculio are almost always found in them, and these larvæ consume nearly all of the spongy matter of the warts, but do not touch the little fungus growing on their surface, which remains, forming a kind of shell, after the whole inside is devoured. But as these excrescences are sometimes found wholly free from the Curculio larvæ and all other worms, it is obvious they are not the cause of their growth. Others have supposed they were analogous to the galls or swellings which we see on the limbs of oaks and other trees, and have even reported that a gall-fly is to be seen at times on these excrescences. But always in galls, one or more seed-like bodies are found in the centre, in which the young of

the fly producing them is inclosed. Hence I know, from their internal structure, that these are not excrescences of that kind: and what the small fly is that has confirmed some persons in this error, we shall shortly see. Others still have maintained that it was a wound in the bark, made by the puncture of an insect, that caused this disease, some saying the remains of this puncture are often to be seen, when the first slight swelling in the bark begins. Yes, I have seen it. It is exactly as they state. Only it is not the puncture of an insect. It is one of the natural glands or pores in the bark, somewhat altered in its appearance, and rendered more conspicuous in consequence of the swelling. And it gives me the opinion that it is in this pore that the seeds of the disease are planted, or, in other words, the contagion or poisonous matter which cause the disease here finds an entrance to the inner bark, which, thus tainted, begins to swell immediately around this pore.

I will not detain you to notice several other conjectures that have been presented to the public respecting the cause of this disease. Suffice it to say, that having now carefully examined these excrescences, from their first commencement, onward through their subsequent growth, I am prepared to say, with the fullest confidence, that the microscope shows nothing whatever about them, externally or internally, indicating that an insect has anything to do with causing them.

It has also been supposed that these excrescences were a peculiar species of fungus growing upon the limb; and there are some things about them which favor this view. But what is a fungus? To express it in a familiar language —it is a body which grows, and forms its own substance, distinct from and independent of the body in which it takes root, and from which it draws its sustenance. Now these black-knots are not such a growth. They are merely a change in the texture of the natural parts of the limb. And thus we arrive at the conclusion, that these excrescences are not of insect origin, and are not a vegetable fungus, but are properly a disease of these trees, whereby the natural tissues, the bark and wood, become softened and swollen at the places affected.

In many respects this disease appears to be analogous to the cancer in the human body. And the most approved remedy for it is the same as in that disease. It is *excision*. Wherever one of these swellings is discovered upon a limb, the limb should immediately be cut off, so far below the swelling as to be certain we remove every taint of the disease.*

But, to return again to the *Curculio*.

We have the fact well authenticated, that this insect breeds in these black-knot excrescences with about the same avidity that it does in your fruit—notwithstanding these substances are as unlike each other.

But the black-knots, like the fruit, have become too far advanced towards maturity, by the middle of summer, for these insects to resort to them to deposit their eggs therein. And the question thus returns upon us—What does the whole generation of these insects, which is bred in the fruit, and which comes out of the ground in their perfect state the last of *July*, now do when there is neither young fruit, nor black knots to accommodate them?

Upwards of fifty years ago, Rev. F. V. Melsheimer, who was the best acquainted with insects of any man in our country at that day stated that the Curculio was bred in the *bark* of peach trees, as well as in the fruit—but without giving any of the circumstances whereby he had learned this fact. And, though no observation in confirmation of this statement have since been made public that I am aware, I am strongly of the opinion that it is correct—and that these insects resort to the bark of different fruit trees to deposit their eggs, when they can find no young fruit to meet their wants.

Four winters since, Mr. L. B. Langworthy, one of the well known nurserymen at Rochester, N. Y., sent me a piece of pear tree limb, to examine a kind of scurf on the bark, which I found to be produced by a minute bark-louse, which I have described under the name of *Aspidiotus furfuras*. As I was passing the magnifying glass over the bark, I detected therein numerous curved incisions, of the same length and shape with crescent shaped marks made by the Curculio on the surface of the fruit; and on the com-

* It is worthy of note, that in the discussion which occurred on the close of this lecture, Hon. A. B. Dickinson remarked that the black-knot only attacks trees growing in a wet sub-soil, and if this soil be suitably underdrained, whereby, to adopt his expressive phrase, the trees will not have wet feet, none of these knobs will make their appearance upon them. On casting over in my mind the different localities where I have observed this malady, I am inclined to think it has been most prevalent and inveterate where either the surface or subsoil was of the character stated. But I have noticed some of these knots on the wild plum trees in the garden of Hon. John H. Bowne, Whitehall, which was originally a naked rock, sufficiently inclined for most perfect drainage, upon which a mellow loam has been drawn, to the depth of two to four feet. A. J Heerman, Esq., of Rhinebeck, has also communicated to me the history of a frost gage growing more than forty years in his grounds, and which had always been perfectly healthy until six years ago, when the black-knot attacked it. The affected limbs were promptly and perseveringly cut off, but without avail, the disease re-appearing, till the whole tree was finally cut down, and yet last season vigorous young sprouts from its roots showed the same malady clinging to them. It hence appears that, though there is probably much truth in Mr. Dickinson's theory, it does not embrace the whole truth. The two cases here related, and the view of Elisha Dorr, Esq., of Albany, that it is a rapid, exuberant growth of the trees that the foundation of this and several other mal-

side of these incisions the bark was elevated in a little, smooth, blister-like spot. On opening these spots, a small cavity was there found, situated immediately under the cuticle or outer skin of the bark, in which what appeared to be from four to six minute footless worms or maggots were lying in a row, side by side, their tails towards the slit in the bark, and their mouths at the opposite edge of the cavity, ready to eat their way onwards in the bark, when the warmth of spring returned to awaken them again into life. It was evident that the curved slit in the bark had been cut by an insect, which had dropped a half dozen eggs therein, the worms from which had fed on the outer layer of the bark directly under the cuticle, all eating in the same direction, and thus excavating the little cavity in which they were lying. They had travelled but little more than the length of their bodies, when cold weather came on to arrest their operations for the time. The worms were so very minute—only 5-100ths of an inch in length—that no opinion could be formed from them as to what insect they were. But the size and shape of the incisions, together with the tree in which they appeared, suggested to me that they were the curculio, and consequently that this insect commits its eggs to the bark, in which it lies, in its larva state, during the winter, to complete its growth, and produce the beetles which make their appearance the following spring.

I will state one fact more in confirmation of this view, that these insects are reared in the bark. The Curculio is so frequently met with in butter-nut limbs as to render it altogether probable that this tree is as much a favorite mode for it as the plum and apple. And the larger size of the specimens found on the butternut, as has already been remarked, indicate that they have been better fed during their larva or pupa state. This difference in size is so great that some collectors have placed such specimens in their cabinets as a distinct species. But, as many other weevils vary in their size to an equal or even greater extent, this cannot be regarded as a valid ground for regarding them as different. Now, as no pulpy succulent fruit exists upon the butternut, it is a strong indication that this insect deposits its eggs to the bark of the limbs—which this tree is remarkably thick and soft, its texture approaching the spongy substance of the black-knots.

Against this view, that the Curculio is nurtured in the bark of trees, and there passes the winter in its larva state, it has been objected, that it is contrary to all analogy to suppose that an insect which feeds on young fruit should also feed on a substance so dissimilar as the bark of trees. But those who make this objection assume to have but a limited knowledge of the habits of insects, and are unaware how diversified those habits often are, to accord with the different circumstances in which the insect finds itself placed at different times. One of the European insects which is most nearly related to our Curculio, both in its form and in its habit, we are told by Kollar, deposits its eggs in the new shoots of the plum when it cannot find fruit for this purpose. Moreover the dry spongy matter of the black-knot is as much unlike the juicy young fruit as is the bark.

To sum up this subject, then—We see this beetle coming abroad with the first warm days of spring, individual specimens of it being found the last of March; and soon after the middle of May they appear in full force, and continue to be common from that to the end of the season. As it requires but six or eight weeks for the egg to become a mature beetle, there are probably three or more generations of it every year—one individual after another coming to maturity and laying its eggs, whereby a constant succession of new individuals are coming forth, as the old ones disappear, through the whole season. They are committing their eggs to the bark of the different trees to which they resort, we suppose, at all times. And when the young fruit comes forward, its pulp, furnishing a more tender and delicate repast to their young than the bark does, they for a time eagerly resort to it, to deposit their eggs therein. When the cold of autumn arrives it overtakes them in all stages of their growth. Some of the beetles newly hatched, and with their stock of eggs not disposed of, it is probable, crawl under stones and clods of earth, or among fallen leaves, or in the crevices of the bark of trees, and similar sheltered situations, and there lie torpid during the winter, as do many other species of the weevil family, to come out upon the first warm days of March and April. Others, it is probable, when cold weather arrives, have recently entered the ground to pass their pupa state. These pupa will remain in the ground through the winter awaiting the warmth of spring to enable them to complete their transformations. Others still are in their larva state, in all the different stages of their growth, in the bark, as we suppose, and also in late ripening thorn-apples, as we know. I may here state a fact which has not yet been mentioned. After the frosts of autumn have become so severe as to suspend insect life for the season, the ground beneath some of our thorn bushes is found covered with fallen fruit, in which curculio worms are sometimes met with, these worms being then of all sizes Such worms will, no doubt, remain torpid in the fruit through the winter, and awake to life the following spring, when those that are full grown will probably enter the ground and complete their transformations, and those that are small will probably perish, as the fruit, after having been frozen, will scarcely nourish them onwards to maturity.

In view of the fact that our injurious insects are usually restrained from becoming excessively multiplied by their parasitic destroyers—other insects which are their most inveterate foes—you will be inclined to inquire, Why do not the destroyers of the Curculio fulfil their office

better, and prevent it from being so exceedingly numerous and destructive?

This brings me to remark, that notwithstanding all the observations that have been made upon this insect, no other insect has ever been discovered destroying this species and repressing its numbers, till within the past six months a species of this kind has been brought to light.

To be concluded in next number.

Agricultural Exhibitions.

The season is near at hand when our annual agricultural exhibitions will take place, and it behoves all persons who are engaged in their management, to endeavor to make them conducive to the public good in the highest degree. The original object in the organization of the societies under whose auspices these displays are made, was the improvement of agriculture. Different views may be taken in regard to the meaning to be attached to the word *improvement* in this case, but we understand its leading sense to be the realization of better returns from the cultivation of the earth. This is the primary object, and should be kept constantly in mind.

A departure from this principle has sometimes been defended on the ground that it was necessary in order to "raise money." But is this any better that the old Catholic practice of selling licenses to commit crime, for the good of souls? If displays of "lady (?) equestrianism" are to be instituted for the purpose of drawing a crowd and getting money, why may not races after greased pigs, and the climbing of "slushed poles," be introduced? We might urge stronger objections to the so-called "trials of speed" in horses, as they make the question of merit and value to depend on the trifling point of speed at a short distance, with light weight, and encourage the practice of gambling.

These things tend to attract and engross the minds of people, and by their prominence throw into the background the more useful objects of exhibitions, which only can be legitimately promoted. Hence, like other evils, they produce their natural consequences, and we do not believe that any society ever made anything, in the end, by obtaining money from such sources.

But other things demand attention. Nowhere is the observance of the maxim "The right man in the right place," of more importance than in agricultural exhibitions. It should be observed in filling all the offices, from that of president down to the awarding committees. The injustice or injudiciousness of the awards of premiums, is a frequent source of disaffection. No doubt there are many complaints without reasonable foundation; yet we have good grounds to believe that awards are not always made on a proper basis—not often through wrong motives on the part of committees, but from ignorance of the true principles involved. It should be the object of societies to select men with special reference to what is required—men who know what are their duties, and knowing dare perform them.

Another matter which deserves more attention, is agricultural addresses. As our views on this point have hitherto been pretty fully expressed, we need not now occupy much space with remarks on it. In the selection of persons to deliver these addresses, the idea is too prevalent that a man who will *draw* must be had. The consequence is that in many cases some political aspirant is chosen, who makes a great flourish, full of sound and flattery, but signifying nothing in regard to agriculture, and worth not one cent to the practical farmer.

On the whole, as the business of so-called agricultural addresses is generally managed in this country, we are inclined to think the public good will be promoted by discontinuing them altogether. They generally occupy time that is of much consequence to the *working* attendants of the exhibition. Sometimes the society is marched in a body through dust or mud (according to the weather) a considerable distance from the show ground and centre of all other business, and after the reading of the important document marched back again. Why could not all the remarks which it is necessary to make on such occasions, be made at the dinner-table?

And this brings us to the subject of agricultural exhibition dinners, and what belongs to them. Under proper direction, the dinner is a very interesting and agreeable feature of the exhibition, and not devoid of practical advantages. It is advisable to prevent, as far as possible, the interference of the dinner with other business, and on this account it is better to make it a final winding up of the exhibition. The remarks at the table should comprehend everything in the way of speech-making or *address* that the occasion requires. And instead of a general address about nothing in particular, would it not be better to have a special *lecture* on some agricultural topic? This would bring out ideas which would be suggestive to farmers in regard to practical improvement.

Speeches at agricultural dinners in our country (or perhaps we should say in *this part* of our country,) are frequently too much on the mutual admiration plan. The speakers, not being able to say anything on agriculture, and feeling flattered by the invitation to show themselves, speak from the fullness of the heart towards those to whom they are indebted. Such personal and often very flat compliments are poor things to treasure up in the archives of a society professing a utilitarian object.

Another fault is the *length* of speeches. In most instances all that any one has to say would be better said in the space of five or ten minutes than in a longer time. It should be understood that one man is not to waste time and weary the patience of the audience in a half hour's speech which interests nobody but himself. The thoughts or sentiments by which it is intended to ca

akers, should each contain an appropriate int, and the responses *should be to the point.* Lastly, "let all things be done decently and order." Let a plan be carefully made for e performance of the business of the exhibi- n and let this plan be worked on strictly, un- s the elements forbid it. The labors of the casion are greatly lessened and made more easant by being reduced to a simple system.— *sion Cultivator.*

Remedy for Pleuro-Pneumonia.

A writer in the Philadelphia *North American* s:—

It happened that, on the same day on which rst saw the recent report from Massachusetts, lso received my supply of a medical journal m London, containing a narrative of several es of the epidemic successfully treated by a geon in England, and the means which he nd effectual as preventive. His report, after ailing the symptoms and medical treatment wo or three cases, concludes as follows:— t would be superfluous to narrate every case, there was a considerable similarity in all; ht were cured, the rest had arsenic every ht, and escaped the disease; four died before as called in." It does not appear that he more than one case, and that under circum- ces unfavorable to recovery, while he suc- ed, as he states, in preventing the outbreak he disease in all the other cattle, which, it t be conceded, is a very satisfactory amount uccess. The remedies employed in the treat- t were aconite, bryonia alba, caustic and monia, phosphorus, sulphur and arsenic, and latter was given also as a prophylactic.* he first medicines to be administrated in this ase are usually one or two drops of the tinc- of aconite in alternation with same quantity e tincture of bryonia alba also in water, at rals of two or three hours. Or, if the pulse ot much accelerated and febrile heat not prominent, caustic ammonia in doses of drops may be given in water. This remedy e has cured many cases of the pneumonia of e. In other cases, the treatment has been essfully commenced with phosphorus and nia, the former in doses of one drop of the ore in a gill of water alternately with the r, at intervals of two hours.

e remedy selected should be continued for ty-four hours or more, if improvement con- to progress; but if in that time the symp- should not be mitigated, or should remain nary, it may be succeeded by others. Thus, treatment be commenced with aconite in nation with bryonia, or with caustic ammo- let them be followed by phosphorus and ia, and then by sulphur in the same atten- uated doses as those of arsenic. Other remedies, such as belladona, thus toxicodendron, cantha- rides, &c., are occasionally indicated and ad- vantageously employed in this disease; but it is not to be expected that the benefit capable of being derived from any remedy can be attained to its full extent, except in the hands of a prac- titioner.

It will be observed that a dose of arsenic was administered to the uninfected cows every night, and I would suggest that two or three drops of caustic ammonia should also be given, in about a wineglass full of water, every morning, for the same purpose. The cattle should be kept dry, and guarded against sudden changes in the weather from warm to cold, and particularly cold and damp weather. The strength of the animals should be kept up by a due amount of nutritious food, and exercise *ad libitum* allowed them through the day.

In the North American and United States *Gazette* of the 17th, I observe a communication from the Belgian Consul, recommending the inoculation of healthy animals with the virus of one dead with pleuro pneumonia, as a preven- tive, and which it is said almost invariably secured them from contagion. He cites the authority of a Dr. Williams (qu. William?) who is said to have discovered this means of preven- tion. In a foreign medical journal, however, now before me, I remark that Dr. Luedersdorf, of Berlin, on exploring the Rhine provinces for the purposes of ascertaining the correctness of Dr. W's assertion, elicited the following as some of the principal facts:—247 cattle were inocu- lated; in 132 of them the local effect of the inoculation was manifested; ten beasts died of the inoculation. Of all those inoculated, six- teen were afterwards affected with the natural disease. In none of those which took the dis- ease had the inoculation produced any local effect. It should also be remarked, that the inoculation was always ineffectual in those which had previously had the disease.

* m the one-tenth to the one-thousandth of a grain of pr pared by trituration with sugar of milk, would fficient dose.

The Anatomy of the Steam Engine.

It is not essential to the caption of this article or to our present purpose to enter upon a re- view of the steam engine constructed through so many years as have elapsed since its inven- tion, or through what slow, though steadily ad- vancing steps, from a rough and imperfect machine, it has become the very king of all motors. The rather do we remark upon the imperfections which still exist, and treat upon their removal. These faults are confined to no one section of the country, but prevail in a greater or less degree everywhere—they prevent the engine from reaching its proper sphere, and from exercising that power which the area of its piston would legitimately give it.

Every machinist and engineer is well aware of the advantage to be derived from close-fitting

boxes (where they should be sq) and from surfaces "out of wind," and the like technicalities, and knowing it as they do, it is injurious to the reputation of any concern to allow its work to go from it in a careless and slovenly manner. It has come within our province to remark many times upon the want of *practical* knowledge displayed in the manufacturing of engines, both as respects the convenience of the design and the proper proportions of the same. If we take the matter of metallic packing for pistons, as generally made, we shall find that, even in cylinders of so small diameter as 12 or 15 inches, the two thicknesses of metal that comprise both the inner and outer rings amount (with but few exceptions) to one inch and an eighth. Now, we would ask where the steel spring is which will set these rings out to the cylinder as they wear, or in fact, what mechanical device or process will do it? It is, of course, easy to do it by set screws and springs, but packing so made is not properly constructed, if it be only from the very large margin it leaves for ignorance and recklessness to damage a great deal of property. In our largest ocean steamers the rings seldom exceed half an inch in thickness (separately), and the packing is insured absolutely steam-tight by springs not over 3-16ths at the middle, and swaged down to an edge at the ends—this in cylinders of six and seven feet in diameter. By what argument, therefore, can we reconcile ourselves to the use of packing in a cylinder which would be suitable for one ten times its size? These are common faults, and we have seen many weary hours of labor expended in efforts to make these clumsy pistons steam-tight. We assert that in engines of from six to two hundred horse-power, the rings do not require to be one-half their present thickness, in their relation to fuel, the wear and tear of material and in a percentum upon the duty done by the engine. All these enter into the account. It would certainly lessen the weight of the piston, which, in a horizontal engine, being always resting on the bottom, is a matter of no small moment. A piston which cannot be made steam-tight by *shoving* in the springs, not driving, is a faulty one, and absorbs power and works to a disadvantage.

In the slide valve, which is the very heart and center of the giant's system, there is the same want of practical knowledge displayed. In too many instances we find a mere nothing in respect to *lead* and *lap*, and a choking of the exhaust ports, which makes it a matter of wonder how the engine ever gets past its center. If we take any ordinary valve and continue the width of its faces across it by means of a square, and afterward mark them outside with a center punch; if we perform the same operation with respect to the ports of the cylinder, and having done so, return the value to its seat and set it with the proper lead (which differs in different work), we shall find that, in numberless cases, the exhaust does not open until the piston has commenced its return stroke some inch or more, thereby causing compression of steam and a needless obstruction and resistance. It is the practice with many engineers to delay the closing of the exhaust till the latest possible moment, in order to retain sufficient steam to fill the ports and waste passages. We regard this as a hobby and not sustained by proof of value. Moreover the exhaust steam does not wait to be punched out by the piston in a properly-made valve, but releases itself through the slightest opening, leaving the piston in a comparative vacuum. If this were not the case, instead of the present we should have a long wheezy sound. It is very easy matter to put a sliding cover on the ports, so that they shall open and close alternately; but a valve which shall work with economy to the engine, requires careful study. Even in respect to weight and unnecessary width of surface, many are wanting. With the different forms of regulator in use, where so many are excellent, it is invidious to particularize; but the old fashioned two-ball governor, which many yet adhere to, there are details which seem trivial and yet are not so. If we look at it, we find in all six joints and pins, whose friction is to be overcome before the valve can be moved. Suppose the machine in operation and the arms revolving, we find that the weight of the balls and the resistance of the atmosphere are continually throwing the faces of the joints against each other, and, in a word, doing all they can to jam them fast. All these joints and pins are fitted tight; consequently, from the very motion of the thing, the apparatus is half the time inoperative. The motion of the rods which move the sliding collar on the shaft is not at right angles and direct, but diagonal, and consequently slow. A properly constructed governor, according to our theory, consists of but four joints; these have no faces, but swing on hardened steel centers, whereby the friction is reduced to the lowest possible point. The balls are at right angles with the shaft, the balls move vertically and the action of the centrifugal force is positive. With such a governor the speed can be maintained to a nicety, on account of the lessened friction, the extreme sensitiveness of which it acts and the correct principles involved in its construction. This detail of an engine from its duty, requires to be as delicately adjusted as possible, or else we shall find the engine racing in speed every minute. And we submit that if an engine, or any machine, be worth making at all, it is worth doing as well as the resources of the age will admit. Absolute accuracy is far to insure perfection, where the general details and design of an engine or machine are faulty; and it is a source of pride to a mechanic when he can point to the product of his brain and capital, and say that the cost of repairs, considered by the amount of duty done, has been infinitesimal.—*Scientific American.*

The best authorities in Chicago now agree in the opinion that the amount of grain which

received in that place during the year ending
31st, 1861, will be 50,000,000 bushels.
this about 25,000,000 bushels will be wheat.

Correspondence.

Township Agricultural Societies.

EDITOR OF THE AGRICULTURIST,—In the re
t of the Dundas County Agricultural Society.
which copious exrracts appear in the *Agri-
lturist* of September 1st, a discontinuance of
Legislative grant to Township Societies, and
exclusive appropriation to County Societies
recommended.

Every one has a right to hold and to express
ions, however contrary to those generally
ived, so long as their practical application
ot detrimental to the well being of the com-
nity: but when a person recommends a prac
unjust in itself, and consequently injurious
ociety, he abuses his privilege, and it becomes
duty of those who would do as they would
done by, to expose its evil tendencies.

he money which constitutes the Legislative
nt is of course first drawn from the people;
residents of remote localities pay their just
portion of the taxes with those who live in
vicinity of county towns, and consequently
an equal right with them to a portion of
grant so long as it is properly and lawfully
ied. It may be said that all can be members
County Societies, and thus participate in its
fits; but this argument is fallacious; dis-
e alone would virtually exclude the majority
e inhabitants of large counties, and place
beyond its influence. Men who live 40
s or more from the place where the County
is held, will have little inducement to be-
members; a few of the townships in its
ediate neighborhood would alone be bene-
, and year after year large premiums would
nto the hands of the favored few; producing
ling of dissatisfaction if not of disgust on
ne hand, and encouraging rapacity and ava-
on the other. The competition being nar-
and the premiums enlarged, the stimulant
nor would degenerate into an unseemly
ble for pecuniary gain, and the "literary
cientific improvement" spoken of, confined
very small circle, the man in the moon de-
about the same advantage therefrom, as
sidents of the distant townships.

ere appears to be a disposition on the part
e officers of some county societies, to un-
e the usefulness of township societies, to
w, or to affect to ignore their claims.
ugh fortuitous circumstances place some
more favourable positions and localities
thers, it does not follow that they should
owed to grasp and retain that to which
ess fortunate fellows have an equal claim.
ness is one of the baser passions of our
, and when combined with arrogance, is
rly odious.

So far from township societies being "*productive of no good, but rather a squandering of public money,*" they are in this part of the country productive of beneficial results, and their management of the funds at their disposal will not suffer by comparison with county societies. If instead of attempting to elevate and improve one part of the community at the expense of another part, by "*rewarding merit with large premiums,*" a desire to obtain honorary distinction as a reward of merit was encouraged by example, the incentive to exertion would be divested of its sordid character, and be more likely to improve and elevate the tone of society.

Near Mount Forest, Sept. 17. C.

Prizes for Milch Cows.

EDITOR AGRICULTURIST,—It appears to me that in deciding upon the merits of the cows shown for prizes at the late Exhibition in this city, their milking qualities were almost totally overlooked. Would it not be well to bring before the Board of Agriculture the subject of offering a special prize for the best milch cow of any breed, the quality and quantity of milk given to be the principal object. The cows to be milked regularly for three days of the fair, and the quality tested by a lactometer. All the cows to be fed alike, while under the care of the judges. JOHN MACKELCAN, JR.

Hamilton, Sept. 25, 1860.

Hedge Plants.

EDITORS OF THE AGRICULTURIST,—Will you have the kindness to give your opinion as to the best kind of hedge plants for ornament—the most certain to grow in this climate. I observe that the nursery vendors have various kinds for sale, such as Barberry, Buckthorn, Red and White Ceder, Osage Orange, Privet, &c. I suppose the fall the best season for transplanting. Yours, &c. A SUBSCRIBER.

Port Rowan, Sept. 29.

[The common cedar makes a very handsome hedge, and so close and strong as to resist any aggressor, large or small. It is very easily transplanted; the spring being we believe the best time for the operation. A very fine hedge of this sort may be seen at the grounds of Mr. Leslie, Nursery Gardens, in this city. The hemlock also makes a good hedge, but does not bear transplanting quite so well as the cedar. The buckthorn also is excellent, perhaps the best plant that can be used for general fencing purposes, of rapid growth, perfectly hardy, and proof against all insect pests. For a merely ornamental hedge, in a garden or pleasure grounds, either the barberry or privet answer very well, and probably there are many other

plants which may be used for the purpose. We have not full information in regard to the Osage orange, but are disposed to think it rather tender for this climate. The general subject of live hedges is a very important and interesting one, and we shall be happy to receive any information from our correspondents in regard to it. —Eds.]

Sorghum Sugar.

Editors Agriculturist,—Can you, or any of your correspondents, inform me of the best way to convert Sorghum into good syrup or molasses, what machinery is required and where it can be procured; how to purify or refine it, if necessary; how thick it must be boiled; and if any means have been discovered to crystalise it so as to form sugar? Yours, &c., R. N. B.

Niagara, Sept. 28, 1860.

Horticultural.

Fruit Growers' Association of Upper Canada.

The lamented death of Judge Campbell of Niagara, who was President and a most active member of the Upper Canada Fruit Growers' Association, seriously interfered with the operations of that useful society, as, in consequence of the sad event, the Annual Meeting, which was to have been held in Toronto, on the third Wednesday of January last, for the election of office-bearers for the current year, did not take place.

Unwilling however, that the society should also cease to exist, after an auspicious commencement and promise of much usefulness, several of its members, among whom were Messrs. Leslie, Arnold, Fleming, Freed, Beadle, Caldwell, &c., met at the late Provincial Exhibition—Dr. Hurlburt, one of the Vice-Presidents, in the chair, and Dr. Craigie, Secretary *pro tem*, when it was resolved to re organize the society; and various committees were appointed to report to a Special Meeting of the Society, to be held in the Mechanics' Institute, Hamilton, on Wednesday the 24th October, at 3 o'clock, this being the day of the Fall Show of the Hamilton Horticultural Society.

We need not add that we hope to receive a satisfactory report of the proceedings, for no one can doubt that a fine field of useful labor is open for cultivation to this much needed association.

Winter Protection for Trees.

by W. C. Strong, in Gardener's Chronicle.

In the cold latitude of New England this subject is becoming increasingly important. Whether because our forests are cleared, and the open country gives more sweep to the wind, or our winters are colder, or a richer cultivation is in practice, and vegetation is more rank and succulent, or because more artificial and delicate varieties of fruit are in vogue,—whether from one or all of these causes, certain it is, that the proportion of failures from the effects of winter is discouragingly on the increase. A knowledge of the cause is a step towards a cure. Doubtless these causes vary in differing cases; but it would seem reasonable to expect that careful observation would teach us wherein lies our greatest danger. The past winter is specially worthy of note, both from its peculiarity, and the severity of its effects. In this region it is the universal experience that evergreens, vines, fruit trees, passed through a scathing trial. In the early part of December the winter closed in suddenly and with considerable severity, and a cause is found in this fact by many. But in December the sap of trees is most thoroughly absorbed, and consequently the trees are in the best condition to endure cold. Unless an unusually warm November should cause a flow of sap, it would seem as though December and January were the seasons of greatest endurance. Excepting a rather unusual cold term in December, which was yet by no means as cold as many nights in January, the winter of 1858–9 was apparently favorable, and only moderately cold. A careful examination of evergreens on the 1st of March convinced me that they had passed the winter with unusual vigor. I am strongly inclined to think this was also true of all deciduous trees. After a mild March and indications of an early spring, on the 3d of April and for four successive days, raged a fierce, dry, cold northwest wind. The cold was not intense, but sufficient to freeze the ground and prevent plowing, which is not unusual at that season. But the wind was intensely trying, harsh and dry, far worse to endure than the coldest zero weather. Why should it not be as true for plants as of animals? Why should not the wind that dries and chaps and cracks the skin, also cause excessive evaporation of plants, suck out their juices and kill them in all stages of exhaustion? The effects of the April wind were very apparent. Trees that were protected by a hedge, were unin- to the top of the hedge; but where they tured above the hedge-line, their tops were off as with a knife. The outside north ranks of nursery trees stood the brunt and fered like the front ranks of a phalanx. W ever trees have had the shelter of other or of a favorable position, they have come the past spring with great vigor; but in ex places, even the Rock Maple has been g weakened, and many branches killed out

hile it is doubtless true that trees are often-imes killed by the intensity of cold alone, yet ason and facts seem also to indicate that the arsh, dry winds, that are so trying to animal ife, are equally injurious to vegetable life, and re much more commonly the cause of "winter-illing" than simple intense cold.

If this view is correct, it is very satisfactory o the horticulturist; for the cause, on its face, uggests a remedy. Sheltered positions can be ound, or shelter can be erected. Hardy ever-reens seem to be the most perfectly adapted or this purpose, and I would name the Austrian nd Scotch Pines as most perfect of all. Their ower of endurance is beyond any other ever-reen with which I am acquainted, and their agged foliage forms an admirable break to the ind. But while simple shelter is ordinarily uite sufficient for most kinds of fruit trees, or least all that can be practicably given, there e other kinds that will repay for ample pro-ection. I confess to some surprise that so much made of the extreme hardiness of this or that riety of the grape, for instance. We hear an troducer claim, that though his "variety may ot be the 'best,' yet it is remarkably hardy." ot long since, a friend and distinguished culti-tor of the grape was pointing out to me the ortality, among some varieties, from the effects cold. I asked him why he did not protect em. He replied, that unless a variety could ok into the very teeth of a north-wester, and nd the brunt of all weather, it should have mediate leave to retire from the list. Now, nall express my opinion with the same bold-ss and say that, by this rule he must disband whole army, (for he is trying them all.)

The truth is, we have no perfectly hardy table apes for New England. Doubtless they may ak at the proper time, and with tolerable ength in most instances; but at best they are t we call hardy perpetual roses. They are rdy; but every cultivator knows how much re vigorously they break and flower if they re winter protection. Am I asked if I would tect the Concord or Hartford? Certainly, all means; lay them down like raspberries. other labor will yield such proportionate re-d. And it seems to be of minor importance t the Rebecca is scarcely able to endure open posure. Compared with the ample returns in or and abundance of fruit, it is so simple and y to cover vines with earth, as raspberries, t I should suppose the practice would be pted by all vineyardists. Even the Peach repay for this treatment in Massachusetts. e year's crop is a total failure. In the spring remium was offered for a dozen peach blooms a any one orchard; yet I know an instance re branches were covered with earth during ter, and they are now loaded with fruit.

n conclusion, beyond the absolutely "killed," ot the weakening process of winter exposure ore important evil than we are accustomed egard it? and are not judicious expenditures for shelter and protection of prime importance to the horticulturist?

Miscellaneous.

Modern English.—The whole literature of notices, advertisements, and hand-bills—no small portion of our reading in these days—seems to have declared war to the knife against every trace of the Angles, Saxons, and Jutes. To be sure there are a few words which will obstinately stick to their places: "of" and "and," and "in" and "out," "you," "I," "they," "is" and "was," "shall," and a few more of the like kind, seem to have made up their minds not to move. But "man," "woman," "child," and "house," have already become something like archaisms. To be sure, what *ens rationis* of any spirit would put up with being called "man," when he could add four more syllables to his account of himself, and be spoken of as an "individual?" The "man" is clean gone, quite wiped out; his place is filled up by "individuals," "gentlemen," "characters," and "parties." The "woman," who, in times past, was the "man's" wife, has vanished still more completely.....We read only the other day a report of a lecture on the poet Crabbe, in which she who was afterwards Mrs. Crabbe was spoken of as "a female to whom he had formed an attachment." To us, indeed, it seems that a man's wife should be spoken of in some way which is not equally applicable to a ewe lamb or a favourite mare. But it was a "female" who delivered the lecture, and we suppose the females know best about their own affairs. To be sure "female" is not our only choice. There are also "ladies" in abundance, and a still more remarkable class of "young persons." Why a "young person" invariably means a young woman is a great mystery, especially as we believe an "old person" may be of either sex. Men and women being no more, it is only natural that "children" should follow them. There are no longer "boys" and "girls;" there are instead, "young gentlemen," "young ladies," "juveniles," "juvenile members of the community." "Houses," too, have disappeared along with those who used to live in them. A man and a woman used to live in a house, but an "individual" or a "party," when he has conducted to the hymensal altar the young female to whom he has formed an attachment, cannot possibly do less than take her to "reside" in a "residence."—*Bentley's Quarterly.*

A letter in the London *Times* describes the fields near Scarborough, England, as being covered with snow in July. In France, too, at Bourges, the people were surprised by a sharp frost, which occured in the midst of a spell of unusual heat.

Transactions.

Abstract of Reports of Societies.

Continued from page 447.

TOWNSHIP SOCIETIES, DUNDAS CO.

MOUNTAIN.—Fifty-four members; amount of subscription, $54; total receipts, $135. Paid in premiums, $109.94; incidental expenses, $25.06.

WINCHESTER.—Fifty-eight members; amount subscribed, $65; amount of public grant, $91.80; balance from 1858, $24.50; total received, $181.30. Paid in premiums, $170.50; incidental expenses, $8.88; balance in Treasurer's hands, $1.92.

To be continued.

MEETINGS OF THE BOARD OF AGRICULTURE.

HAMILTON, August 14th, 1860.

The Board met at the Royal Hotel, at 1 p. m.

Present: Messrs. E. W. Thomson, (President,) R. L. Denison, Hon. H. Ruttan, Hon G. Alexander, Asa A. Burnham, Wm. Ferguson, J. Wade, Dr. Beatty, J. E. Pell.

The minutes of last meeting were read and approved.

The following mentioned communications were submitted:—

From Mr. Hutton, Secretary of the Bureau of Agriculture, with drawings and description of a new Flax Scutching Machine, manufactured and patented by Messrs. Rowan & Sons, of Belfast, Ireland; the machine being capable of dressing about 1 lb. of flax per minute, and would cost delivered at Toronto or Hamilton, about $900. Mr. Hutton recommended the same to the notice of the Board.

From Mr. Hutton, on the subject of the cattle disease called Pleuro Pneumonia, prevalent this season in Massachusetts, enclosing a communication from Mr. Jas. Anderson, of Montreal, addressed to His Excellency the Governor General, and another from Mr. S. J. Lyman, of Montreal, on the same subject; and requesting the Board to report on the same. These communications were referred to a Committee, consisting of the President, Mr. Wade, the Secretary and Dr. Beatty.

From Mr. Gillespy, Secretary of the L Committee, Hamilton, *enclosing the foll* ing resolution of that Committee:

"Moved by Dr. Hurlburt, *seconded* Alderman Meakins, and *Resolved*—Th representation be made to the Board of A culture, that an unusually large expendit will be incurred in preparing for the S of next September, and that as the occa of this great additional expense, namely visit of His Royal Highness the Prin Wales, will add immensely to the rece from the sale of tickets, that, as the exp will fall on the Local Committee, and profits be reaped by the Agricultural A ciation, the Board of Agriculture be a to allow the Local Committee a liberal gra

From Mr. J. S. Wetenhall, Hami applying for the appointment of Ge Superintendent to the Association.

From Mr. Hutton, Quebec, enclosi communication from Col. Irvine, A. D to His Excellency the Governor Gen stating that His Royal Highness the P of Wales would probably be in Ham about the 17th September.

Mr. Denison submitted a design of ar for Prizes, which was approved of, an Committee on the Prize List was instru to get the medals executed.

The Board then adjourned, at 3 p. m meet the Local Committee on the Ground.

TORONTO, Aug. 15th, 1

The Board met at the office, Toron 9 a. m.

Present: The President, Messrs. Den Ruttan, Beatty, Pell.

Minutes of yesterday read.

A communication was received fro Local Committee embodying certain re recommending an appropriation of hundred dollars in aid of musical per ances to be given in the Crystal Palace ing the Exhibition by the Philhar Society of Hamilton, and also of the s three hundred and seventy-five dollars given in prizes for bands.

A communication was also received the Local Committee enclosing the foll resolution adopted at their meeting j day:

"Moved by J. F. Gilkinson, and sec by Mr. Wade,—That the President Board of Agriculture be requested t

te to His Excellency the Governor Gen-
l that the Agricultural Association desire
t it may suit the convenience of His
yal Highness the Prince of Wales to visit
Provincial Show on Wednesday, the
h, and open it on Thursday, the 20th
tember; and that the Hon. Sir A. N.
cNab, and the Hon. G. Alexander and
other members of the Board of Agricul
in Quebec be a Committee to represent
views of this Committee."—Carried.

rom Mr. Hutton, Quebec, August 13th,
ing that from information he had received
elieved from the 18th to the 21st Sep-
er would be the time which would best
the convenience of His Royal Highness
Prince of Wales to attend the exhibition.

rom the American Pomological Society,
ing the Board to send delegates to the
th session of the Society, to be held in
ity of Philadelphia, commencing 11th
mber next.

esolved,—That the exhibition take place
e 18th, 19th, 20th and 21st September,
hat the suggestions in the resolution of
local committee in reference to His
l Highness the Prince of Wales be
ed.

solved,—That in reference to the Re-
f the Committee on Public Entertain-
recommending an appropriation of
to the Philharmonic Society, this
cannot concur therein, as from past
ience they consider an entertainment
kind proposed on the opening of the
ition will be attended with the most
ous consequences to the goods exhi-
besides other serious inconveniences.

olved,—That the Report of the Com-
on Bands be adopted in so far as the
mme is concerned and the amounts,
ith the understanding that the Local
ittee so arrange that music be fur-
whenever required for the purpose
sement, and that the judges be ap-
by this Board, and the premiums
y the Treasurer in the usual way.

olved,—That should the Hamilton
ittee adopt a banquet in connection
he Provincial Show, that the Board
riate the sum of two hundred dollars
purchase of tickets to present to
uished visitors.

lved,—That the President of the
the President of the Association,
and the Hon. Mr. Ruttan, be a committee to prepare an address to be presented to His Royal Highness the Prince of Wales at the opening of the Provincial Exhibition at Hamilton, and that the address be suitably engrossed

The Board then adjourned to August 31st, at Hamilton.

HAMILTON, Friday, Aug. 31, 1860.

The Board met at 10, a.m., pursuant to adjournment.

Present—The President, Messrs. R. L. Denison, Asa A. Burnham, Dr. Beatty, Mr. Pell.

Minutes of last meeting were read and approved.

The following communications were received:—

From Dr. Hurlburt, of Hamilton, requesting a reconsideration of the resolution in regard to the Concert of the Philharmonic Society in the Crystal Palace.

From the Secretary of the Local Committee on the same subject.

The President submitted a draft of the address to the Prince of Wales, adopted by the Committee appointed at last meeting, which was approved, and copies ordered to be prepared accordingly.

From Mr. G. A. Bull, Superintendent of Schools in the township of Barton, requesting that the school children of all the common schools in the county might have free admission to the exhibition grounds.

From Hon. Adam Fergusson, dated July 16, in reference to the cattle disease in Massachusetts, expressing his opinion that from the praiseworthy and energetic measures there adopted, the disease would not extend beyond the State; and also stating that he had been informed by an able veterinarian, that aconite, if the disease was attended to in an early stage, was almost a specific.

From Mr. Samuel Hodgskin, of Guelph, on the subject of stalls for horses and cattle, requesting that parties might be allowed to secure possession previous to the show.

From Mr. Wetenhall, Secretary of Hamilton Electoral Division Society, stating that the funds of that Society would be paid over to the Association and the names of members given, previous to the show.

From Mr. C. H. Vernon, President of the Township of Haldimand Agricultural

Society, in reference to proposed changes in the Agricultural Statute, expressing the opinion of that Society that if the Mechanics' and Arts Institutes are allowed to send Delegates to the Provincial Association, the Township Societies ought also to have the same privilege.

From Mr. Wetenhall, of Hamilton, renewing his application for the appointment of General Superintendent.

Mr. Denison submitted the following draft of Rules for the appointment of a General Superintendent, and the organization of his department:—

"The Superintendent to be selected, if possible, with a view to continued services, so that experience gained may benefit the Association.

The Superintendent to ride a good horse, and to remain mounted as much as convenient, so that he may be seen from every quarter of the grounds; the horse if possible to be of a conspicuous color, say black, white, or cream.

The Superintendent to have general charge of the grounds, of the people, and of every article after it has been admitted through the gates.

The Superintendent shall submit for the approval of the Board, a list of all the men he may deem requisite to employ as police, or care-takers, or workmen, and shall have power to dismiss any man employed who may be unfit for his duty, or insubordinate, which men shall at all times be under the direction of the Superintendent.

The Superintendent shall keep an office on the ground, and have a clerk, who shall be present in the office at all times, and keep the time of the people employed in his department, and call the roll every morning at eight o'clock, or at least one hour before the grounds are open to the public.

The Superintendent, clerk, and all under him to be supplied with a particular badge, and have admittance into the grounds at all hours, either day or night, by application at the proper gate.

The Superintendent to receive all the Judges' Books from the Secretary, and give them to the proper Jury, or be present when they receive them from the Secretary; to hunt up and introduce all gentlemen forming a jury, that they may know each other before they commence their work.

The Superintendent to see that all classes of machinery, stock, grain, roots, implements, &c., be put and kept together, in order that the Judges may not have to hunt them from all quarters..

The Superintendent to see that the proper people attend upon the Judges when required; and have all horses, cattle, &c., brought out of stable or into the rings when necessary, with a view to saving time, and having everything done in order.

The Superintendent to prevent as far as possible exhibiters and others from taking any article on exhibition from the ground until the Exhibition is closed, or a special order exhibited signed by the President.

On motion, the foregoing draft of rules and regulations for the government of the General Superintendent's department was adopted.

Moved by Dr. Beatty, seconded by Mr. Burnham, That Mr. Wetenhall's application for the appointment of General Superintendent be accepted.—Carried.

Mr. G. A. Bull's communication was considered, and compliance therewith declined, on account of the great inconvenience it would cause in the general arrangements.

Ordered—That public notice be given that applications for close stalls will be received by the Secretary till Wednesday, 12th inst., $4 to be paid for each.

The President reported that the committee appointed to confer with the local committee, in reference to the expenditure, had done so on Saturday, 18th August, and had apportioned the expenditure as they considered in accordance with the law and constitution of the Association, between the city authorities and the local committee, the expenditure on the part of the latter committee to be defrayed from funds now in possession or at their command, and such funds are exhausted the balance to be paid by the Board.

A communication was received from Mr. Stock, of Flamboro, embodying a letter from Mr. Ferguson, of Kingston, on the subject of the pedigree of some Durham cattle, the consideration of which was deferred.

Resolved,—That Mr. Pell do take charge of the goods in the Crystal Palace.

Ordered,—That the Secretary prepare a general notice, that in view of the Prince of Wales' visit taking place one day earlier than was expected, it is absolutely necessary that articles be on the grounds on Saturday and Monday, so that they may

ranged by Tuesday morning, and that live ock must be on the grounds as early as ssible on Tuesday, none later than noon.

Resolved,—That in respect to the renewed pplication of the Local Committee for the rformance of the Philharmonic Society at e opening of the Exhibition, this Board ill withdraw its objection thereto, although the same time they hereby record an exression of apprehension that damage is kely to ensue from such a performance to e goods exhibited.

The Board then adjourned to Thursday e 13th, at the same place.

HAMILTON, Thursday, Sept. 13.

The following members were present at e Royal Hotel, at 2 p.m., pursuant to journment, viz., the President, Messrs. nison, Beatty and Pell.

There not being a quorum of members sent, after attending to some committee siness the meeting was adjourned to nday the 17th, at the show ground, milton.

HAMILTON, Monday, Sept. 17th, 1860.

he Board met in the Committee Room, the show ground, at 4 p.m.

resent—The President, Messrs. Alexer, Christie, Burnham, Denison, Ruttan, le and Beatty.

he minutes of previous meeting were and approved.

r. Ferguson's letter, submitted at the ious meeting, in reference to the pedi- of a Durham cow, sold by him to Mr. R. O'Reilly, was considered, and it

esolved,—That the Durham cow Sontag lowed to compete, with the understandhat if any premium be awarded it be held till the pedigree be established.

solved,—That the members of the l Committee have complimentary tickets mit themselves and families during the ition.

dered,—That the only private entrance fficers, judges, &c., be through the ess office.

dered,—That the members of the city ation be furnished with complimentary s for themselves and families the same members of the Local Committee.

A communication was received from Mr. Widder, Commissioner of the Canada Company, requesting to have samples of the prize wheat, peas, barley, rye and oats for transmission to the Company's offices, England, in order to afford the people of the mother country the means of forming correct impressions of the grain-producing capabilities of this Province.

Resolved,—That the specimens of grain be furnished Mr. Widder, as requested by him.

Ordered,—That the Board meet every day during the show week at 9 a.m.

The Board then adjourned.

TUESDAY, Sept. 18, 1860.

The Board met at 9 a.m.

Present—Hon. Mr. Alexander, Hon. Mr. Christie, Mr. Wade, Dr. Beatty, and Mr. Pell.

Mr. Wade, President of the Association, in the chair.

Some routine business was despatched.

At ten o'clock the judges nominated by the different Societies assembled in the Committee Room, and were appointed to the different classes.

The Board adjourned.

WEDNESDAY, Sept. 19, 1860.

The Board met at 9 a.m.

Present—The President, Messrs. Burnham, Wade, Beatty, Denison.

Minutes read and approved.

Ordered,—That the members of the Philharmonic Society have admission tickets free to the performance on Thursday.

A draft of rules and regulations was submitted from Wetenhall, General Superintendent, for the management of the exhibition, and the arrangement of the stock and articles, on the arrival of the Prince, which was approved.

The Board adjourned to 4.30 p.m.

Same Day, 4.30 p.m.

The Board resumed.

Present—The President, Messrs. Ruttan, Alexander, Burnham, Denison, Wade, Beatty, Pell.

Moved by Hon. Mr. Alexander, seconded by Mr. Pell, and

Resolved,—That this Board deeply regret that His Royal Highness the Prince of

Wales should not have had an opportunity of privately visiting the exhibition as proposed this day. The disappointment was occasioned in the first place by the visit having been published in the programme without the knowledge of this Board, and secondly by the guard of honor having been posted at the gate and leading to the main entrance. This Board would, therefore, most humbly and respectfully invite His Royal Highness to again visit the exhibition at such time and in such way as would be most agreeable to him, and that Messrs. Wade, Thomson, Alexander and Beatty be a deputation to wait upon His Royal Highness forthwith, with a view of carrying out such arrangement.

The Board adjourned.

THURSDAY, Sept. 20, 1860.

The Board met at 9 a. m.

Present: The President, R. L. Denison, Hon. D. Christie, Wm. Ferguson, Hon. H. Ruttan, J. Wade, Rev. Dr. Ryerson, Dr. Beatty.

Resolved,—That this Board will instruct that the Palace shall be kept closed until after the visit of the Prince, and that R. L. Denison, Esq., be appointed Marshal of this day, to make such arrangements as may be necessary for exhibiting horses, cattle, &c., to the Royal Party.

Several appeals in reference to the decisions of the Judges were received and referred to Committees to investigate the same.

The Secretary submitted the engrossed copy of the address to His Royal Highness the Prince of Wales, to be presented at 11 a. m. this day on the grounds, together with the copy of the volumes of the Transactions of the Association therein referred to, suitably bound and enclosed in a case for the occasion, which were approved of.

The Board then adjourned.

VISIT OF HIS ROYAL HIGHNESS THE PRINCE OF WALES TO THE EXHIBITION.

At 11 30 a. m., this day, (Thursday, Sept. 20,) His Royal Highness the Prince of Wales arrived upon the grounds, attended by the Duke of Newcastle and other members of his Suite, and took his place upon the platform erected near the Crystal Palace, upon which were also assembled the members of the Board of Agriculture.

Mr. Wade, President of the Associatio then read the address, as follows:—

To His Royal Highness, Albert Edwar Prince of Wales, &c. &c.

MAY IT PLEASE YOUR ROYAL HIG NESS:—We, the Agriculturists, Artisa and Manufacturers of Upper Canada, beg appr.ach your Royal Highness with our e pressions of devoted loyalty to Her Ma Gracious Majesty's Crown and person, a to offer to your Royal Highness a most c dial welcome to this exhibition of the p ducts of our soil and of our labour. This the fifteenth exhibition of the Agricultu Association of Upper Canada, and we think demonstrates to those who have witnessed i successive exhibitions from year to year, t they have been success-ful in stimulating industrial classes in the improvement of those productions upon which the prospe of this portion of Her Majesty's Domini mainly depends.

Blessed with a fertile soil and healt climate, and forming a portion of that ex sive empire over which Her Majesty's be rule extends, and in which it is exerci-e the maintenance of the religious and rights of all classes of Her subjects, we with delight the auspicious event of Royal Highness' visit to this Colony, rejoice that we have this opportunity of hibiting to your Royal Highness, as we what we hope we may call an honest pri exhibiting, as to our future Sovereign, proofs of the industry, skill and intelli of the inhabitants of this country.

We gladly embrace this opportuni expressing our ardent desire to maintai connection of this Province with that and glorious empire of which we rejoi forming an integral part, and from whi have in great part derived our Agricu as well as our existence; and whilst ar ourselves of the example and improve of the older portions of the empire, the many natural advantages we poss our soil, climate, and navigable wate trust that our efforts may result in affo convincing proof that this Province is a valuable jewel in the crown of our b Sovereign.

We hopefully pray that the interco your Royal Highness with the inha of Canada, and the opportunity you had of witnessing the efforts we are t to advance the material interests of ou

may, during your future life, leave a pleas- impressi n in your memory.

That your Royal Highness may be placed possession of statistical and other facts nected with the rise and progress of this sociation, we beg that your Royal High- will condescend to accept these volumes, taining a record of the Transactions of is Association from its establishment.

To which His Royal Highness made the lowing reply :—

GENTLEMEN,—I return you my warm nowledgments for the address you have presented upon the occasion of opening fifteenth exhibition of the Agricultural iety of Upper Canada, and I take this rtunity of thanking the agriculturists, ans and manufacturers who are now mbled from distant parts, in this City Hamilton, for the more than kind and usiastic reception which they gave me erday, and have repeated to-day.

lessed with a soil of very remarkable lity. and a hardy race of industrious enterprising men, this district must lly assume a most important position in markets of the world, and I rejoice to that the improvements in agriculture, h skill, labor and science have of late developed in the mother country, are increasing the capabilities of your soil, enabling you to compete successfully the energetic people, whose stock and products are now ranged in friendly y within your own within this vast sure.

e Almighty has this year granted you greatest boon to a people—an abundant st. I trust it will make glad many a of those I see around me, and bring sed wealth and prosperity to this mag- nt Province.

duties as Representative of the Queen, ed by Her to visit British North ca, cease this day; but in a private ty I am about to visit, before my re- ome, that remarkable land which claims s a common ancestry, and in whose ex- inary progress every Englishman feels mon interest.

re, however, I quit British soil, let e more address through you the in- ts of United Canada, and bid them tionate farewell.

God pour down His choicest bles- pon this great and loyal people.

His Royal Highness and Suite then visited and examined the various departments of the exhibition in the building and grounds.

FRIDAY, Sept. 21, 1860.

The Board met at 9 a. m.

The minutes of yesterday were read and approved.

Present: The President, Messrs. Alexander, Ruttan, Denison, Burnham, Christie, Ferguson, Wade, Beatty, Pell.

Several appeals against awards of the judges being made, it was

Resolved,—That Messrs. Christie, Burnham and Ferguson, be a Committee to adjust the premiums in the Agricultural department, and Messrs. Alexander, Beatty, Ruttan and Pell in the Arts department.

Mr. Ferguson brought up the subject of his letter read at a previous meeting in regard to the pedigree of a certain Durham Bull formerly owned by him, and claimed that as the bull had been exhibited and awarded premiums at former exhibitions of the Association, he should now be entered in the Stock Register kept at the office of the Association. After some conversation on the question of pedigrees the Board adjourned for the Annual Meeting of the Association at 10 a. m.

Editorial Notices.

University College.

DEPARTMENT OF AGRICULTURE.—The regular course of Lectures on the Theory and Practice of Agriculture, will commence on Monday, October 15th. Occasional Students can enter this class at any time, but it would be most advantageous for them to do so as early as may be practicable, and not later than the beginning of January. Such students are not subjected to any preliminary examination, and can attend courses on Chemistry, Geology, Botany and Natural History, History and English Literature, &c. The fees are merely nominal, so that a young man may go through a pretty extensive course of instruction during the winter months, on subjects that have an immediate bearing on the ordinary pursuits of life; the only expense worth naming is that for board and lodging.

Full particulars may be obtained by applying personally, or by letter, to Professor Buckland, University College, Toronto.

The Late Provincial Exhibition.

The Fifteenth Exhibition of the Agricultural Association of Upper Canada, held at Hamilton last month, was we think beyond doubt, as many of our readers of course had an opportunity of witnessing for themselves, the most successful which has yet taken place in the Province. Indeed we doubt very much whether a more excellent, full and imposing display of the products of a country was ever offered on any part of this North American continent. Whether in the department of live stock, agricultural or horticultural products, implements, or domestic manufactures, the array of animals or articles equalled or surpassed, both in number and quality, those upon any previous occasion. On the whole the exhibition was one of which Canada may well be proud, and grateful that she has the soil and climate and the industrious and enterprizing inhabitants to enable her to make such a display. And occurring upon the peculiar occasion it did, we mean concurrently with the visit of the heir to the British throne to this part of the empire, accompanied as that visit was by many distinguished and observing persons from abroad, we may confidently anticipate that the late exhibition will be of great value to us by disseminating in the British Islands and elsewhere, a true knowledge of the producing capabilities and resources of our country. As we shall give a full and complete report of the exhibition in all its departments, with a correct list of the prizes awarded, in our next and succeeding numbers, this brief notice must suffice for the present.

West Northumberland Agricultural Society.—The Fall Show of this Society will be held at Cobourg, on Wednesday, 17th inst.

Our Present Number.—Owing to several unavoidable circumstances, the present number of the *Agriculturist* has been delayed considerably past the proper time of publication. We shall be up to time again after the next number.

An Old Gentlemen, who was never accused of being a wizard, went out with his gun one day to hunt squirrels, accompanied by his son. Before they approached the ground where they expected to find the game, the gun was charged with a severe load, and when at last the old gentleman discovered one of the little animals, he took a rest and blazed away, expecting to see him fall, of course—but not so did it happen, for the gun recoiled with so much force as to "kick" him over. The old man got up, and while rubbing the sparks out of his eyes inquired of his son, "Alphy, did I point right end of the gun at the squirrel?"

Markets.

TORONTO MARKETS.

Friday, Oct 12, 18[illegible]

Of Fall Wheat the deliveries to-day were[illegible] bushels, which sold at on advance over yester[illegible] The best grades sold at from $1 25 to $1 38; [illegible]age $1 30 per bush. There was a good de[illegible] inferior which sold at from $1 20 to $1 24. [illegible] little sold below $1 20. Of Spring Wheat [illegible] bshls sold at from $1 05 to $1 10. Of Ba[illegible] 3,000 bshls sold at from 62c to 66c; average[illegible] Of Peas, 1,000 bshls at from 54c to 60c. Of [illegible] 800 bshls at from 28c to 30c. Hay, $11 to [illegible] per ton. Straw, $6 to $7 per ton.

NEW YORK MARKETS.

New York, Oct. 12, 18[illegible]

Flour—receipts 27,687 brls; the marke[illegible] day is without striking change; sales, [illegible] brls at $5 35 to $5 40 for superfine State; [illegible] to $5 60 for extra State; $5 35 to $5 40 for [illegible] fine Western; $5 55 to $5 75 for comm[illegible] medium extra Western; $5 75 to $5 90 f[illegible] ferior to good shipping brands extra round[illegible] Ohio.

Canadian Flour—unchanged; sales 5[illegible] at $5 70 to $7 50.

Rye Flour—steady at $3 50 to $4 40.

Wheat—receipts 73,596 bshls; market [illegible] is a shade better with a fair export demand; [illegible] 90,000 bshls at $1 21 to $1 25 for Chicago S[illegible] $1 26 to $1 30 for Milwaukie Club; $1 35 [illegible] 37 for winter red Western; $1 42 to $1 [illegible] white of all kinds.

Rye—firm; sales 1,000 bshls at 90c.

Barley—in moderate request; sales 9,1[illegible] of State at 75c to 80c.

The Agriculturist,

Or Journal and Transactions of the

of Agriculture of Upper Canada

Is published in Toronto on the 1st and 1[illegible] month.

Subscription—Half a dollar per annum for sin[illegible] Eleven copies for Five Dollars; Twenty-two copi[illegible] Dollars, &c.

Editors—Professor Buckland, of University C[illegible] ronto, and Hugh C. Thomson, Secretary of the Boa[illegible] culture, Toronto, to whom all orders and remit[illegible] to be addressed.

Printed for the Board of Agriculture at 77 King S[illegible] Toronto.

☞ Not being now able to supply the first [illegible] bers of the current volume, the subscription f[illegible] "Agriculturist" from 15th May to the end o[illegible] will be 30 cents per copy, with bonus at the [illegible] as previously, viz: one additional copy with every [illegible] and paid for in advance.

For the half year commencing 1st July the pri[illegible] cents. Nine copies for $2.