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THE

Canadian Agriculturist,

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OF UPPER CANADA.

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No. 21.

Hints for November.

The agricultural year in this part of the world may now be considered almost closed. What still remains to be done consists in finishing the getting up and storing away of root crops, a work that should now be completed without delay. Ploughing should be proceeded with as long as the ground continues unfrozen, and every effort made to give a finish to the operations of the farm before stern winter finally sets in. The severe and protracted drought of the spring and early portion of summer seemed at the time almost to annihilate the farmer's hopes, but in consequence of subsequent rains and genial temperature the result of his labors and care has far exceeded the most sanguine expectations. In many parts of the Province the crops in general were proved abundant, and in none has any thing like a failure been experienced; a circumstance that imperatively calls for gratitude to the bountiful Giver of all good.

The farmer in this climate, whatever perseverance he may have exercised, always finds enough to do at this season to bring his operations to a proper and satisfactory conclusion by the time that the advent of winter actually takes place. Too many have not safely stored their roots or completed as much ploughing as is desirable before that imperious master—frost—puts a stop to most out of door operations. The ploughing deeply, and however roughly heavy land, so as to expose the largest amount of surface to the action of frost and snow, produces a vast benefit

on the soil in a chemical as well as mechanical point of view, and materially diminishes the labour of spring in procuring a suitable seed bed for next year's crops. On some soils autumnal ploughing will save at least twenty-five per cent of spring labour, besides the enriching of the land without any outlay to the farmer. The soils least benefitted by these means are such as are naturally loose and sandy, the particles of which will often run together before the time of spring seeding, and become almost as compact as though they had not been operated on with the plough.

Another subject demands the farmer's attention at this season, namely the scouring, when necessary, of surface drains. Before the setting in of winter all obstructions to be found in ditches and open furrows should be removed, that the large amount of water occasioned by the melting of the snow and the rains of spring may readily find an exit, and thus prevent the serious injury so often seen done both to the soil and the young crops by the action of stagnant water. Winter wheat is often seriously injured from negligence in this matter. At present, and in the nature of things it must in a new country continue so for some time to come, the surplus of our fields is often very irregular and uneven, and the water which accumulates in the depressions of our fields, proves highly detrimental to the cultivated crops. Under-draining and getting a smooth surface must necessarily be the work of time, involving too

much thought, labor, and expence. But it is obvious to every observer of rural affairs how much is commonly neglected to be done, that might have been accomplished without involving much, either of time or outlay. A man with a spade, if nature or art has provided an outfall, may often in a few hours relieve large portions of a field of most if not all of their stagnant surface water, by deepening at places the furrows made by the plough, or such portions of the ditches or natural drainage as are too shallow or partially obstructed. Wheat fields should be carefully examined with this object in view before the ground becomes permanently frozen. This would be a cheap way of benefiting both the soil and the crop.

Stables, byres and yards should be now examined and such repairs effected as are necessary for the production and thrift of live stock, which frequently suffer as much from wet and cold draughts as from irregular and inadequate feeding. The farmer should always bear this truth in mind, that all our domesticated animals thrive better on a smaller amount of food when kept dry and warm, than with a larger quantity however nutritious, under opposite conditions. Notwithstanding the shortness of the hay crop, what with the abundance and quality of straw and roots, cattle if properly protected, kept clean and dry, and regularly fed, may be carried through the approaching winter in a healthy and improved condition. The greatest care should now be taken that chaff, straw, &c., be properly husbanded, and that turnips, carrots, mangels, &c., be secured stored away so as to be available for use not only through the winter, but a portion reserved by what is often as pinching a time as any, early spring.

The Wire Worm.

To the Editor of the *Agriculturist*.

DEAR SIR,—Permit me, through your paper, to inquire of you and your readers the best means to be adopted in order to destroy the wire-worm, or at least to prevent its ravages, or if there are any means of doing so.

My crops have for the last few years been almost totally destroyed by it; and the wheat which is now growing on my farm, in one field more especially, is being cut off very fast by it, so much so that I believe it will be all, or nearly all, gone before the frost sets in; and to plough it up to sow spring wheat, barley, &c., believe would be useless, as such would in all

probability share the same fate. I have tried many ways to banish it without effect. Different ways and plans have been suggested to me by various individuals, some towards its eradication, and some again as a means only of preventing it working at the wheat plant. Some of these I have tried which I found to be of no service. Now, for general information, I submit to you the following, all of which I have heard and seen recommended:—First, the propriety of rolling the wheat in the fall and spring with a heavy metal roller. Second, the propriety of ploughing in the fall and summer following the next season, keeping the land clear of weeds, &c. Third, propriety of sowing lime, salt, or soot. Fourth, the propriety of growing buckwheat on the fallow, and ploughing it down when in bloom. Fifth, the propriety of sowing soda-ash a short time before sowing the wheat.

With respect to the first question, rolling, have heard it mentioned as a means of preventing the worm injuring the wheat; in fact have heard some of my neighbours who have tried it say that such entirely stopt its progress. How this can be the case (if it is so) seems a mystery to me. It may be in consequence the soil being pressed tightly together and being made hard about the roots of the plant I have noticed that the looser spots in the field are always worse affected than the harder ones.

As to the second question—ploughing in the fall, &c.—suggested as a means of starving the worm out, I have ploughed in the fall and found it to be of no service to spring crop that is as far as the worm is concerned, for the barley and the spring wheat which I sowed in it were as much destroyed as on a piece in the same field which was not ploughed until the spring. But summer-fallowing the next season, after the fall ploughing, may starve them out and would it not be a good plan, after summer-fallowing, instead of sowing fall wheat, to let it stand over and sow spring wheat? By this means a person could give it a second fall ploughing without much loss.

As to the third question—sowing lime, &c. some recommend one and some another of them.

As to the fourth—growing buckwheat—have tried this without effect, but the buckwheat was a poor crop, which may account for the failure.

As to the fifth—sowing soda-ash—I have seen it highly recommended in a Belfast newspaper as being an effectual cure.

By answering the above questions, or making any suggestions that may be beneficial towards the eradication of this pest—wire-worm—you will confer a great favour on your humble servant, and let me know by what means, if there are any, I could save the crop which is now on the ground. Any information from you or any of your readers on this topic will be thankfully received.

By giving the above an insertion in your paper you will much oblige;

Yours, &c., AGRICOLA.

Chingacousy, 27th Oct., 1862.

[We are not acquainted with any specific or absolute method of exterminating the wire-worm, that will be effectual under all circumstances. Most of the means mentioned by our correspondent, although they appear to have failed with him, will, one or other, be found generally to mitigate the ravages of this destructive pest. Our correspondent's case appears to be an extreme one, and nothing less, perhaps, than the burning of the soil, will effect a thorough cure. Old pastures, when broken up, are peculiarly liable to have their cultivated crops, for several seasons, injured, and sometimes totally destroyed by the wire-worm; and this is not unfrequently the case on badly tilled land abounding in weeds, on the roots of which, as well as those of cultivated crops, the larva of this beetle finds a subsistence. Several expedients for destroying it in gardens may be readily applied, and with, to a great extent, certain success; such as burning, deep and frequent digging, hand-picking, &c., appliances generally too expensive and tedious on a large scale. In raising hops in England, it is not uncommon to put around the hills in spring the first year after planting a few cut potatoes, for which the wire-worm has a particular liking. These potatoes are taken up, and, if need be, others planted, every few days. In this way coun less numbers of the larvæ are captured, and the roots of the young hops preserved. Our correspondent will find in the 12th volume of the *Agriculturist* for 1860, pp. 29, 46, 64, an essay on the wire-worm, treating the subject somewhat in detail. We shall be happy to hear from any of our readers who have had experience of, or made observations on this matter, and shall be happy to embody their remarks in a future article or articles at the earliest opportunity.—Eps.]

Short-Horns as Snow Stock.

A disposition to lay on fat rapidly, leading to a more than usually early maturity, is a prominent feature in the improved short-horn. This desirable quality is, however, often grossly abused, especially in the case of stock intended to compete at the principal shows. The practice may have originated, perhaps, in a desire on the part of breeders to prove the extraordinary fattening properties of the breed at a time when it was fighting its way into public estimation, and when it had to contend against prejudices in favor of other established breeds.

Whether this supposition be correct or not, it is at least a well-known fact that almost every person who intends to show his short-horns in public considers it necessary to prepare them for exhibition in a very different manner from the course which would be followed were the animals to be kept at home solely for breeding purposes. A very liberal milk diet is supplied in the case of young bulls and heifers for many months after they would have been weaned under ordinary circumstances; and not only are they amply provided with that very nourishing description of food, but they are also crammed with cake, boiled barley, malt, even double X, and in short, every kind of food which is calculated to swell out their proportions, and cover every point with flesh and fat. A similar system is pursued in the case of older stock, and thus the "breeding classes" at our shows usually present an array of animals which would fill appropriately the stalls at a Christmas exhibition, but which are sadly out of place when shown as "breeding" animals. We have frequently seen butchers, in a mixed show of breeding and fat stock, selecting the cow or heifer which had been awarded the gold medal as the best of all the breeding animals as being the fattest animal in the show, far excelling, in a butcher's estimation, any of those which had been avowedly prepared for slaughter.

We emphatically protest against a system of judging which awards prizes to "breeding animals, forced into such an unnatural state as this—forced until it becomes absolute cruelty for any one to insist on their being made to stand up even for a few minutes—until their ungraceful, waddling, hobbling gait, on being led out, produces painful feeling in the minds of spectators, instead of the unqualified admiration which might and ought to be elicited. And such decisions deceive no one—none, at least whose opinion is worth having. The ticketed and be-ribboned monsters may call forth the empty praise of those who poke at them with daintily gloved fingers or with the point of natty parasols, simply because poking of some sort or other is supposed to be essential in the examination of every prize animal; but the real Simon Pures look on with a very qualified degree of admiration; and whilst they certainly contemn plate with interest the well-covered ribs and loins, the overhanging rumps, and the general state of obesity which, like charity, covers perhaps a multitude of faults, ask one another, with a very doubtful air, "Will they breed?" Ay, that's the rub; will they breed?

Now for a practical reply to this very practical question. Year after year and show after show, prizes are withheld from animals in the breeding classes, simply because those animals have not fulfilled the conditions. To speak in technical phraseology, they have not "qualified." They have proved barren—barren of produce, at least, though not of fauce, to their owners.

They stood first at such and such Royal Shows—such is the record in aftertimes; but the fact that they were subsequently deprived of any permanent token of their honours, owing to their barrenness—their artificially created barrenness—is studiously kept out of sight. But, although the money prize has not found its way into the purse of their owner, nor is the medal produceable, their temporary honour serves as an advertisement for other, perhaps inferior but more useful, animals of the same herd, and the value of the latter becomes heightened in consequence of their relationship to the winners. That is the secret. Forcing for show purposes is only a mode of advertising the excellence of the owner's wares; for short-horn breeding is quite as much a trade as shoemaking or tailoring; and though in some respects a costly mode of advertising, still it pays, and pays well too, in certain cases. Of this we have a clear example in the success and high standing of the Warlaby herd; for, without attempting for a moment to detract from the unquestionable merits of the Warlaby short horns, we may be permitted to doubt whether Mr. Richard Booth would ever have enjoyed—and long may he enjoy—his comfortable income of £5,000 a year from the hiring of his bulls, were it not that he regularly sacrifices some of his best females to the absurd necessity which exists of overforcing for royal show exhibitions. And perhaps this very circumstance proves more than anything else the extraordinary excellencies of the Warlaby short-horns. Mr. Booth's females are crammed for show purposes, and sacrificed in consequence as breeders; and yet the standing of the herd is kept up by breeding from what may be called, comparatively speaking, the very weeds of the herd. Such being the case, the reflection naturally arises in one's mind. What would that herd become, and to what pitch of excellence would it arrive, were show judges invariably to act as they would do while purchasing for themselves, and, by their uniform rejection of all animals unfit for breeding in consequence of overforcing, encourage a feeling in favour of natural condition, and thus save the lives, and secure the usefulness, of those wonderful short-horns which are annually sent forth from Warlaby? If the éclat conferred by even nominal success at a Royal Show pays Mr. Booth, and atones for the loss of usefulness on the part of the prize females of his herd, we cannot, nevertheless, consider it in any other light than a national loss, when the flowers of such a herd are compelled to be sacrificed in order that they may attain a certain standard of excellence, which is never taken into consideration, and is even scrupulously avoided, at any other time than at a show, or believed to be desirable in any save show animals.

It is not because Mr. Booth is a sinner above all others in respect to overforcing his short horns that we thus allude to him. It is because

he is—to use the designation applied to him by his fair and enthusiastic disciple, Lady Pigot—"the hero of short-horns;" because when we speak of "Booth blood," we refer to the most successful line of short-horn blood in existence; for the majority of winners at all the shows in the kingdom have Booth blood in their veins; and for these and other reasons we hold it to be a national loss, as we have said, when such a man as Richard Booth must yield to a fatal and absurd passion, whenever he chooses to become an exhibitor, and by doing so deprive the country of the advantages which would follow to remain in a natural state, so as to transmit their peculiar excellences through a line of healthy and prolific descendants.

But although it may, perhaps suit Mr. Booth and a few other breeders to run great risks, it does not suit everyone to follow their example. And it is because many have tried to do so when they had not the right stuff nor the same advantages to fall back upon that we find in short-horn history so many instances of what we must call disappointed ambition, and of temporary success followed by sudden and utter extinction. All who are acquainted with such matters know that many individuals have attempted to become eminent short-horn breeders and exhibitors, and failed in the attempt. They have gone to great expense, without much judgment as to the materials they were collecting for the foundation of their future herds; they have forced their show stock, and they have sometimes even got a prize or two; but the very expensive cost of their whistle has ultimately sickened and frightened them, and they have abandoned the pursuit in disgust. Now, if those people had chosen to rest contented with moderate expectations, to have gone quietly and reasonably to work, it is most likely their efforts would ultimately have proved serviceable to the community and profitable to themselves, instead of leaving them in such a position as to act merely as beacons, to warn others of the rock on which they made shipwreck.

For all these evils there is a remedy, and we feel convinced it is high time it should be applied. Let it be perfectly understood that judges at our royal shows are resolved to reject every animal which comes before them, no matter how superior that animal may be in other respects, provided it is shown in such a state from forcing as to render its qualification, as a breeding animal doubtful. Let this rule be firmly and uniformly acted upon, and there will be no more forcing, the finest and, therefore, no more sacrifices of cattle in the world. For breeders who are exhibitors do not follow the practice because they like it; they have no desire to do so, but they have no option. They must either force or stay at home. There is, no doubt, a regulation in the programme of our principal societies to the effect that judges are expected

to disqualify animals which do not appear to be in a fit state for breeding purposes; and in the cow classes it is expected that "a live calf" shall be produced within a certain period after the prize has been awarded. But both regulations are often a dead letter, and might as well be omitted altogether for all practical purposes. Judges look to condition, and favor it; and the "live calf" may only have had sufficient strength to draw a single faint and almost imperceptible breath ere its existence terminates—a finale attributable solely to its dam's unnatural and unhealthy "condition."

It is necessary that show regulations should contain a proviso of the nature we have mentioned, but it must be evident that everything depends on the judges as to the manner in which a regulation of this nature shall be carried into effect. We do not mean to say that judges do not act conscientiously under the circumstances when they give prizes to over-fed animals; but we do mean to say that in doing so they act very differently from what they would do were they making a selection for their own use and advantage; and all we ask is, that they would act for the public as they would do for themselves. Let them do as they would be done by. For what is the object of their appointment as show judges? It is to tell the public which are the best animals for breeding purposes out of a number brought under their notice; and it appears passing strange that they should select as patterns the very fattest, as they almost invariably do, or at least, with comparatively rare exceptions: whilst all the time they would never think for a moment of keeping their own regular breeding cattle—male or female—in anything like similar condition. It is in this very point that the absurdity of the present system of judging lies; it is founded on a most vicious and ruinous fashion, and we decidedly think that the judges, who are breeders, should set their faces against it for their own credit, whenever an opportunity offers, and thus confer an inestimable benefit on all concerned.

Nor need we be afraid that the interest felt in our shows would be lessened were natural condition encouraged, instead of being discouraged as it is at present. We entertain the opinion that our show catalogues would present a much greater array of entries, and that the effect of encouraging natural condition would be to bring out many first-rate animals, of the existence of which the public are scarcely aware, as these are at present kept at home, because their owners prefer that they shall be sure and regular breeders, rather than prize winners followed by infertility, or at least great uncertainty as to whether they shall afterwards perpetuate their kind or not.

It is not, however, in the short-horn sections alone that the evils of enforcing are evident. Hereford breeders are equally culpable, and, in fact, with the exception perhaps of West High-

lands, Ayrshires, and Alderneys, it is questionable if there are any of our British breeds which have not suffered more or less from that practice. We have all heard of short-horn cows and heifers being shown and winning at Christmas shows of fat stock, and then, instead of being handed over to the butcher, as one would anticipate from their appearance on occasions of this kind, taken home and shown next summer in the breeding class of a royal show, and we have considered such proceedings as savouring somewhat of the preposterous, but we have also known precisely the same thing done in the case of heifers of the Angus breed. And when we go into other classes of stock, into the sheep and swine sections of our shows, the same forcing system is found to prevail, and the decisions of judges in such cases are just as liable to be influenced by "condition" as in the short-horn and other cattle classes. It is, in short, a general as well as a crying evil; the great blot on an otherwise commendable "institution"—that of public competition; and it is satisfactory to know, therefore, that public feeling is decidedly in favour of its entire and immediate abolition; "a consummation," no doubt, "devoutly to be wished," but which depends wholly on the managers of our royal shows, and our royal show judges in all departments.—*Journal of Highland Society.*

Experiment to Test the Profitableness of Various Kinds of Sheep.

A very interesting experiment, to test the fattening qualities, as well as the profitableness, of various kinds of sheep, has just been brought to a conclusion at Millhill, Inchtute, by Mr. McLaren, factor to the Right Hon. Lord Kinnaird. The sheep selected to be operated upon were Col. Inge's breed of Leicesters, Lord Kinnaird's breed of the same sheep, Mr. Hardie's border Leicesters, and Lord Kinnaird's Greyfaced Cotswolds. Ten of each variety were chosen, and the experiment extended over twelve months. Unfortunately, the season was very unpropitious, the continued wet inducing foot-rot in many of the animals, which occasioned the death of some and threw others very far back—so far, indeed, that several of them were a good deal heavier two or three months before the experiment was completed than they were at its termination. Those dying had to be replaced by others not equal in points of weight or excellence, so that the test, so far as the whole ten in each lot are concerned, is not so absolutely perfect as could have been wished, though quite as correct as it was possible, under the adverse character of the weather, to make it. No doubt, it is almost of equal importance for farmers to know the hardiest kinds, or which will stand best an exceptionally moist season like that which we have just experienc-

ed. But that is a question which we do not at present propose to discuss. We pass over also all reference to the weight of the fleeces, and we do so the more readily as we understand that Mr. M'Laren, whose admirable practical essays have more than once secured the Highland Society's premiums, will supply an elaborate paper on the whole subject to the *Transactions* of that society. In the meantime, we doubt not the readers of the *Scottish Farmer* will be glad to learn the result so far as it relates to consumption of food and fattening alone. In order to show as nearly as possible the true fattening properties of the several varieties of sheep, we shall take only four out of each lot of ten, these four having kept almost, if not quite, free from the rot during the whole of the time that the experiment lasted.

Beginning with Colonel Inge's Leicesters, we find that four of these consumed on the average, in the course of the year 2,122 square yards of grass, 932 lbs. of clover, 10,799 lbs. of turnips, 1,144 lbs. of mangels, 200 lbs. hay, 74 lbs. of chaff, 53 lbs. of Indian meal, 6 lbs. of Indian corn, 528 lbs. of cake, and 365 lbs. of oats. The four sheep at the beginning of the experiment weighed respectively, 88 lbs., 86 lbs., 86 lbs., and 86 lbs.; at the finish they weighed 160 lbs., 159 lbs., 161½ lbs., and 159 lbs., showing on an average, a gain in live weight of nearly 74 lbs. each, or a total gain of 295½ lbs., which, say at 6d. per lb., would yield at £7 7s. 9d.

Four of Lord Kinnaird's Leicesters consumed 2,084 square yards of grass, 780 lbs. of clover, 10,479 lbs. of turnips, 1,178 lbs. mangel, 214 lbs. of hay, 76 lbs. of hay chaff, 53 lbs. Indian meal, 6 lbs. Indian corn, 451 lbs. cake, and 365 lb. oats. The live weights of each at starting were as follows:—75 lbs., 84 lbs., 80 lbs., and 81 lbs. At the conclusion they were 164 lbs., 146½ lbs., 155½ lbs., and 164 lbs. There was an average gain in the weight of each of 77½ lbs., or, on the whole four, of 309 lbs., at 6d. per lb., as before, £7 14s. 6d.; showing a gain of 6s. 9d. over the other lot. But this positive gain does not represent all the advantage Lord Kinnaird's Leicesters possess over their more thoroughly English neighbours. They acquired this at a smaller consumpt of grass, clover, turnip, and cake. To ascertain, then, the real superiority of the one over the other, our readers must debit Colonel Inge's Leicesters with 38 square yards of grass, 152 lbs. of clover, 300 lbs. of turnips, and 77 lbs. of cake, which they consumed over and above Lord Kinnaird's variety; and the latter with 34 lbs. of mangels, 14 lbs. of hay, and 2 lbs. of hay chaff which they eat more than Colonel Inge's. We do not put a money value on these things, because the prices varies much in different districts, and because each reader can easily do that or himself in accordance with the prices in his own locality.

We now come to Mr. Hardie's Leicesters—the Scotch or border Leicester, as they are

called. Four of these consumed 2,235 square yards of grass, 1,010 lbs. of clover, 12,093 lbs. of turnips, 1,229 lbs. mangels, 250 lbs. hay, 70 lbs. hay chaff, 53 lbs. Indian meal, 6 lbs. Indian corn, 529 lbs. cake, and 365 lbs. oats. At the commencement, these sheep weighed respectively, 91 lbs., 90 lbs., 92 lbs., and 93 lbs.; and at the finish, 198 lbs., 181 lbs., 188 lbs., and 182 lbs., showing an average increase on each of 95½ lbs., or on the whole, an increase of 383 lbs., which, at 6 per lb., would return £9 11s. 6d. This is a gain over Lord Kinnaird's, so far as mere butcher value is considered, of £1 17s.; but then the greatly increased consumption of Mr. Hardie's lot reduces, very materially, the apparent profit. They eat 151 square yards of grass more, 230 lbs. of clover, 1,614 lbs. of turnips, 51 lbs. of mangels, 36 lbs. of hay, and 6 lbs. of cake. In other words, as much more grass as would have kept a third of a sheep of Lord Kinnaird's breed, as much more clover as would have kept one sheep and a fifth, as many more turnips as would have kept three-fifths of a sheep, as much more mangels as would have fed the sixth of a sheep, as much more hay as would have fed two-thirds of a sheep, and as much more cake as would have fed five-sevenths of a sheep. Speaking approximately, this experiment shows that about five of Lord Kinnaird's sheep could be kept on the same quantity of food that is needed for four of Mr. Hardie's. The gain in meat of these five sheep would fully equal Mr. Hardie's four, while the fleece of the fifth sheep would make his Lordship's more profitable than the others.

The grayfaced Cotswold consumed 2,182 square yards of grass, 1,050 lbs. of clover, 12,533 lbs. of turnips, 1,442 lbs. mangels, 254 lbs. hay, 86 lbs. hay chaff, 53 lbs. Indian meal, 6 lbs. Indian corn, 529 lbs. cake, and 363 lbs. oats. Their live weight at the commencement was respectively, 100 lbs., 108 lbs., 96 lbs., and 89 lbs. At the final end of the trial they weighed 188½ lbs., 181½ lbs., 183½ lbs., and 190 lbs. There was thus an average gain on each of 87½ lbs., or 350½ lbs., on the whole, equal in money value, calculated at the same rate per lb. as in the former cases, to £8 15s. 3d.—16s. 3d. less than Mr. Hardie's Leicesters, which consumed 40 lbs. less clover, 440 lbs. less turnips, 213 lbs. less mangels, 4 lbs. less hay, and 16 lbs. less hay chaff, but 53 square yards more grass. The trial, therefore, would seem to show that Lord Kinnaird's Leicesters are the most profitable keep, omitting the wool. A thorough test, in addition to the particulars above given, would include the price of fleece, the age, and the values of the sheep at starting. Taking the latter in a rough way; at 6d. per lb., we find that the original value of Colonel Inge's four was £8 13s., and the produce in twelve months, £7 7s. 9d.; of Lord Kinnaird's Leicesters, £8 0s. 6d., to yield £7 14s. 6d.; of Mr. Hardie's Leicesters, £9 3s., to produce £9 11s. 6d.; and of the gray-

faced Cotswolds, £9 16s. 6d., to return £8 15s. 3d. In proportion to their value, Mr. Hardie's and Lord Kinnaird's Leicesters again show best. Of course this reckoning is not free from empiricism; but we think it is sufficiently indicative of the value of each class of animal to be of some little use to those interested in sheep feeding.—*Scottish Farmer.*

Farm Capital.

Money is needed by the farmer in the prosecution of his business—(1) for payment of rent and taxes for the land he hires; (2) for the purchase and maintenance of implements, of draught animals, and of steam power for the cultivation of the land, and for the conversion of its produce; (3) for the purchase of seed and manure; (4) for payment of labour during the year; (5) for the purchase of live stock by which to consume the green produce of the farm, and by which to provide the home supply of manure on which its fertility must depend.

It is plain that the amount which is made up of these items will vary exceedingly with the circumstances of the farm—(1.) Rent may not be asked for out of capital at all; the landlord may give twelve months' credit and ask for it directly (as he necessarily always does essentially) out of the produce of the land, not out of the capital which the tenant brings on it. Rent, moreover, whether long credit be given for it or not, varies between wide limits according to the quality of the land. It may be 15s. or 20s. an acre or it may be 40s., 50s., and it may vary even from 5s. to £5 per acre, according to the fertility of the land and its neighbourhood to good markets.

(2.) The amount needed for the purchase of farm implements and draught animals necessarily varies with the quality of work needing to be done. Stiff clay arable land cultivated highly needs more costly equipment in this way than lighter, poorer soils, more easily cultivated and laid down probably two years out of every five in grass; and both need larger outlay on implements and power than pasture land. The implements of arable land will cost from 15s. to 25s. an acre, and the horse power perhaps 15s. to 30s. an acre. This supposes steam power to be *hired* for thrashing purposes. If it be provided for steam cultivation, a twelve-horse engine and apparatus, displacing twelve or fourteen horses and their implements and somewhat more, must be added to the capital thus required.

(3.) The amount needed for seed and manure is also extremely variable. From 10s. to 20s. for clover, and grain crops, and from 2s. 6d. to 10. for root crops; probably from 10s. to 15s. on the whole arable farm will be needed for the former; while for the latter the sum required varies from nothing up to as far as another rent, according to the spirit of the farmer and the proved experience of the locality. There are

many farmers who pay £1 per acre annually for artificial manure.

(4.) Labour varies from 4s. or 5s. an acre on grass up to 50s. per acre on our arable land. In the "Hand-book of Farm Labour," the particulars of farms amounting to 7,824 acres of acres of arable land, and 1,690 acres of pasture, are given; the wages paid on these farms were £14,423 per annum, or, deducting £423 for the pasture, 33s. an acre for the arable land.

(5.) The capital needed for the purchase of live stock and for extra food for them is the last item on the list, and this obviously will differ with the fertility of the land, the activity of its cultivator, and the rotation of crops adopted; and even in the case of pasture lands, where the natural fertility of the soil is the leading point, it varies from £2 or £3 an acre to £12 or £14—the grass in the former cases fit for little more than a sheep or two per acre, and the latter feeding annually a heavy bullock. On ploughed land the influence of various rotations comes into play, and the quantity of meat made annually per acre has been shown to vary from 30 lbs. or less up to 1 cwt. or more. In the former case it is plain that the stock will not need to be more than a sheep to every acre or to every 1½ acre; in the latter, it may be as much as three sheep or more per acre. But these calculations do not proceed upon the more economical processes now adopted, in which roots are pulped or steamed, and straw is cut into chaff, and much purchased food is used, so that the estimate of the capital under this head may vary from £1 or less per acre up to £5 or more, or when heavy crops of roots or straw are grown and double crops of vetches and rape, &c., are taken and consumed upon the ground.

Adding these items together, it will be found that the capital required on arable land varies from £7 to £15 per acre. Of these sums a varying portion will be payable on entering the farm on valuation to the out-going tenant, who will have spent for his successor certain amounts under most of these headings.

He may have paid for labour and for seed and for manure upon certain portions of the farm, and he may hand over by valuation certain portions of the implements and live stock which he has used upon the farm. Of the remainder a varying portion under most of these heads will not need to be paid until after harvest, when means may be provided for the purchase of live stock, and for the payment of rent by the sale of grain. In this way the burden of these demands upon the purse of the farmer is considerably reduced.

Nothing has been said of works for the permanent improvement of the land, which are properly a landlord's portion, but which, if the tenant be secured for long enough in his occupation, may be profitably undertaken by the latter. Almost unlimited scope for the profitable application of capital to land is thus provided over a

great extent of the island; and the influence of the lease in leading thus to the higher cultivation of the land has been already referred to.

As a last word upon the capital of the farm, it may be well to remind the farmer of his interest in insuring his capital, however it may be invested, against the risks of fire, disease, and death, which will be accepted for him by the various insurance companies on payment of an annual premium.—From 21st Edition of Arthur Young's Farm Calendar.

The Agriculture of Sweden.

TO THE EDITOR OF THE MARK-LANE EXPRESS.

SIR,—Having just concluded a two-months' fishing tour in the central provinces of Sweden, I extract from some memoranda, chiefly relating to matters piscatorial, a few notes on the farming of the country, which perhaps may not be entirely without interest to some of your readers.

The district I refer to, and which extends from Gothenburg and Uddevalla on the west coast to Northkopping and Stockholm on the east, consists of extensive tracts of table-land, rugged hills, chiefly of granite, but occasionally alternating with primitive limestone, vast pine forests, and lakes resembling in magnitude inland seas. There is soil here of every variety, from the stiff clays yielding heavy crops of wheat, beans, peas, clover, and timothy, to the sandy and peaty soils appropriated to the growth of rye, oats, barley, and potatoes.

The farms in Sweden, strictly so called, are not numerous, more than three-fourths of the kingdom being in the hands of peasant proprietors or freeholders, a kind of petty yeomanry holding from 5 to 100 acres of arable land, the average being about 30. This independent class of men generally becomes wealthy by the same process which enriches so many of our pastoral farmers in the dales of Yorkshire and Westmoreland—the keeping down of all outgoings on land, or living and laying by of all the incomings however small. Some, however, whilst retaining their peasant rank, live in comfortable style, keeping good steeds in the stable, and good wines in the cellar, and perhaps represent their class in the Royal Assembly, of which the House of Peasants is the largest if not the most influential branch.

In addition to his arable ground, the peasant has invariably a tract of rough pasture land, generally moor, mountain or forest glade, where he pastures his cattle in summer, cutting the best part of it for hay. The holder of 20 acres of arable will thus keep six or eight cows in addition to a pair of working bullocks and a horse, their sole subsistence in winter being straw and wretched hay; for the peasant rarely grows roots or clover, but cultivates his land, as his fathers have done before him, on the two-course

shift, half-fallow, half-grain alternately, about one-seventh of the fallow being dunged yearly; the great object apparently being to grow as much grain as possible with the least expenditure of labour and manure. Vast tracts of rich loamy clay on the east coast of Lake Wetteren have been so cultivated from time immemorial, and still yield weighty crops of grain.

The Swedish farmer is of an entirely distinct class from the peasant, and, in virtue of his usually superior education and creditable character and habits, occupies an important social position. He is generally the Thane of his district, a man of urbane address and liberal ideas, and does the honours of his house and table, which are seldom wanting in the elegancies and comforts of life, with graceful and genial hospitality. He is often obliged to be as much *mercant* as agriculturist; for a Swedish farm, in addition to its generally large extent of arable land, frequently includes a flour mill, a saw mill, and a roofing and draining tile manufactory, and perhaps a Brunvin distillery, where the potato crop is converted into spirits.

The peculiar features of a Swedish farm may, perhaps, be best understood by a description of one in the occupation of a very enterprising agriculturist at whose house I had the honour of being most hospitably entertained. The farm of Graffnaas, near Allingsås, comprises 9,000 acres, of which 1,000 are arable, 500 pasture, and 7,500 forest. The rent is £800 a-year. The soil varies from stiff clay to light loam, but is chiefly loam on a clay bottom. The fields are large—from 40 to 80 acres; 400 acres are in oats, the land being at a high elevation; 40 in wheat, 80 in rye, a few acres in oats and vetches for horses, and 20 in turnips and potatoes. The land reserved for pasture is not sufficiently good for arable, being for the most part marshy, or cumbered with rocks or brush-wood. All the best of this pasture is mown yearly, without any return of manure, which is never applied to meadow land in Sweden.

The forest portion of the farm is chiefly valuable as affording small holdings for *torpare*, an inferior grade of peasants, who render to the occupier of the farm, in lieu of rent, labour in proportion to the value of their respective tenures. Thus the holder of from 20 to 30 acres works for the farmer, personally or by substitute, every day during June, July, August and September, and two days a week the rest of the year, *extra* labour being paid for at half the usual rates, namely, half a rix-dollar, or 7d a day for a man; one third of a rix-dollar for a woman, and one-fourth, or 3½d for a boy; this scale being reduced in winter. In summer the men work from five in the morning till eight at night, after which they have often some miles to walk home. It is not unusual to see farms advertised to be let or sold, as having the right of five, ten, or twelve thousand day's labour in the year attached to them. In the farm of Graff-

naas 2,000 acres of forest land are held by torpare or bonders; 360 in small cut-lying patches of arable, the rest consisting of open glades, scrub, or marsh. The torpare on this farm, including all ages and sexes, amount to about nine hundred souls, of which about two hundred and fifty are available for work, and the average amount of labour done by them on the farm is that of forty men daily the year round. The horses of the torpare (in this case about forty) are also at the disposal of the farmer; but this right is sparingly exercised, except for the carting of timber for farm or household purposes, or of grain to market, or during harvest-time, when they are frequently all summoned to the field. The peasant has this protection against an oppressive exercise of authority, that he is at liberty to quit his holding after fifteen months' notice, which he must also receive before he can be discharged from it.

The management of the Graffnaas Farm would reflect credit on any Norfolk or East Lothian farmer. The fields, roads, ditches, &c., are beautifully kept; the under-drainage which now extends over one-half of the farm, has been scientifically conducted, the drains, 4 feet deep and 22 feet apart, being uniformly in the direction of the fall. On this point the Swedes appear to be generally in advance of many of our Yorkshire farmers, who still adhere to the diagonal direction, without considering that on this system only one side of the drain will act. Another point on which I believe most English farmers might take a lesson from them is that they invariably begin to lay the pipes at the upper instead of the lower end of the drain, thus avoiding what otherwise so often happens, especially in wet weather, and when the fall is slight, the studging up of the pipes as the work proceeds. The pipes used at Graffnaas are 1½ inch, the main drain consisting of six, laid pyramidally.

The rotation on this farm is—first year, fallow danged; second, rye or wheat; third, clover and timothy, one crop; fourth and fifth, ditto pastured; sixth, wheat, half-danged; seventh, oats; eighth, peas, tares, potatoes or turnips, with bone-dust, or oats again without manure. 18 pairs of work horses are kept, and there are 160 head of dairy cows, and forty heifers and calves, which (contrary to the usual custom in Sweden of keeping the cows in the house till the hay crop is off) are pastured from the beginning of May till the end of September. Two-thirds of these cattle are of the native breed (worth about £6 a head), the rest either pure Ayrshire or crossed with Ayrshire, 20 cows and a bull of that breed having been entrusted by the Swedish Government to the farmer, with a view to the improvement of the breed of the district. The only return required by the Government for this gift is that of two bull calves yearly, which are sold on behalf of the State, or consigned gratuitously to other farmers. The consignee of these 0 cows is further restricted from selling their

male offspring till they are two years and a half old, prior to which period they are not supposed to have attained the requisite vigour or development. The improvement effected by this cross on the native breed—which are too frequently such as the patriarch Noah would, probably, have hesitated to admit in to the ark—is very marked; and my opinion was frequently and earnestly asked, as to whether any superior advantages would accrue from the use of a Short-horn bull in the place of an Ayrshire; a question which it is difficult to decide, considering the inferiority of the pasture and the severity of the winters generally combined to render necessary the house feeding of the cattle 7½ months in the year, and that the staple food of the people is not beef and mutton (of which they produce and import but little), but rather bread, milk, cheese, and butter, the imports of which actually exceed in value (in this extensive and thinly populated country) £100,000 yearly. The question was more than once asked me, "Why do not Englishmen, possessed of a little capital, come here instead of going out to Canada or Australia?" and it is perhaps worthy of consideration, whether a country so near our own shores, and in many respects so favored might not afford scope for the energies and enterprise of British agriculturists who feel the want of elbow room at home. My own impression, however, is, that were a man of moderate capital to emigrate there, with the idea of teaching the Swedes, and to introduce costly implements or expensive cattle, or any material innovations upon the established system of farming, without due regard to the exigencies of the climate and country, he would soon find himself at the end of his tether. For example, high-bred cattle would scarcely be remunerative in a country where beef and mutton, generally indifferent enough in quality, but excellent under the Swedish mode of cooking, may be bought for 3d. and 4d. per lb., and capital veal for 5d. Reaping machines would hardly effect a saving, where stout men can be had for the work at the rate of a penny per hour; or threshing machines, where threshers are contented to take every fifteenth or sixteenth sack in lieu of money wages. Two steam-ploughs have been introduced into Sweden by a wealthy landowner—one into the South, the other to a farm 20 miles from Wettersborg; but it is credibly reported that the labour of men and horses employed in the transport alone of English coal, by necessarily light loads over the hilly country, would suffice to plough the whole farm.

It is more than doubtful, therefore, whether any English settler, imbued with English notions of scientific cultivation, would meet with much success in a country where the conditions of climate and labour are so different from his own; but were he first to acquire by a year or two's tutelage under some intelligent farmer, a knowledge of the language of the country, and of the system of agriculture, which the observation

and experience of practical men have established there, and after maturely considering the nature and requirements of the soil and climate, cautiously and gradually to improve upon, rather than alter existing practices, judiciously applying the cheap labour at his command, and making the most of the internal resources of the farm, so as to avoid all unnecessary outlay on experimental farming, implements and manures, he would then, probably, receive better interest on his outlay than appears to satisfy so many of our agricultural farmers at home, in these days of high rents and heavy taxes. Were he further to possess the requisite mechanical skill and mercantile knowledge, he might probably turn the mills and factories, so frequently appertaining to Swedish farms, to very profitable account. Thus, on one farm north of Uddevalla, were two flour mills, with eight pairs of stones, working night and day, the year round, and yielding a clear annual profit of above £400 a-year. The manure left by the horses bringing grist to the mill, and waiting there, exceeds 1000 cart-loads yearly. There was here also a tape manufactory employing 40 hands; a small iron-foundry where castings were made, and nails, ship-anchors, hawsers, and wheel tires forged—the ponderous hammers, the furnace blast (of three cylinders), and whole machinery being worked by the never-failing water-power of a magnificent trout and salmon stream. The farm here had evidently suffered from the attention of the tenant being divided between it and the more important occupation of his mills. It was neglected and unproductive, though I observed upon it a source of fertility invaluable in a granite district—extensive beds of calcareous matter in the form of marine shells, in an apparently calcined state, sometimes imbedded in blue clay, and retaining their perfect shape; and sometimes, where almost unmingled with earths and crumbled by exposure to the air, closely resembling bone-dust.

In one respect, and under not unusual circumstances, a Swedish farm would seem to hold out to a man of small capital, advantages which are not offered in this country. I mean that of taking the farm with the live stock, horses, and implements upon it, thus enabling the tenant to retain his farming capital to meet rent and expenses till his grain crops become available for that purpose. Thus, a Swedish friend of mine lately had the offer of a farm at Linköping, the capital of the rich province of that name, lying on the east of Lake Wetteren, consisting of 520 Scotch acres in 10 fields of 50 acres each, 20 acres being in meadow. The soil is principally loam and marl on clay sub-soil, about 50 only being hard to work, and that not so stiff as much of the land in the Carse of Gowrie. The stock, which is let with the farm, consists of 60 cows, 19 pairs of working oxen, 5 pairs of horses, some young colts, 50 sheep, and excellent and extensive buildings and dwelling house, the latter with 13 rooms. The rent asked was £525

English, and if from this be deducted £50 a-year as the produce of a saw mill and flour mill, and £50 on the score of cattle and implements (which may be estimated as worth £1,000), it leaves the rent about 16s. a long acre. £60 a-year covers all government, parochial, and other outgoings, and there are six torpare or free-labourers.

The yield of grain in Sweden varies, according to the season, soil, and husbandry, from four to six quarters of wheat to the long acre, and from four to eight of barley. The price of wheat is from 45s. to 60s. the qr., according to quality and the markets; barley, 25s. to 30s.; rye, 32s. to 35s.; oats, 16s. to 20s. This year the yield and quality of the grain, owing perhaps to the moist spring and cloudless summer and autumn, is without precedent. The farmers know not where to be tow their increase, and it is calculated that at least three millions of barrels will be available for exportation.

In speaking, however, of this year's yield of grain in Sweden as unprecedented, it must be remembered that a greatly extended area of land was brought under cultivation in the time of the Russian war, when rye rose from 13s. to 30s. per barrel, and land temporarily at least, about 50 per cent., and that, under the impetus then given to agriculture, deep drainage and tillage, with careful cultivation, have yearly made rapid progress, and resulted in increasing produce; the very peasantry beginning to feel that agriculture is a progressive art, and exhibiting, in many instances, a spirit of active improvement. The marvellous increase of produce in Sweden, wherever thorough-drainage has been effected, leads irresistibly to the conclusion, that the vast tracts of stiff retentive soils yet undrained, or drained only by open trenches and water furrows (the inefficiency of which appears in stunted crops and coarse herbage), would afford profitable employment for English capital. Sweden is pecuniarily a poor country, and there are everywhere (but especially now, under the depression caused by the American war,) estates on sale. Not more than one-third or one-fourth of the purchase money is usually required to be paid down, the payment of the rest being extended over a series of years. It is impossible, of course, to give any very accurate idea of the value of estates in that country: but, at a loose computation, it may be said that five hundred acres of average land may be purchased for £10,000, the addition of two or three thousand acres of pine forest not materially enhancing the price, unless where the vicinity of a navigable river gives a marketable value to the timber. Such purchases should, of course, be judiciously made; if possible, near some line, or projected line, of railway, canal or navigable river, or seaport—the land sufficiently concentrated, and as level as consistent with easy drainage, and the buildings—as is almost always the case in Sweden—con-

veniently placed, extensive, and well-arranged. Such farms, I think, let to intelligent tenants—the landlord providing for them draining pipes, and subsequently lime, and exacting under occasional supervision, a proper system of drainage and cultivation, but at the same time an easy rent at the outset, augmentable to a certain extent in a specified ratio yearly, as the condition of the farm and its tenant improved—could hardly fail to return a much higher rate of interest than is compatible with anything like good security in England; to say nothing of the prospect of more or less increase to the saleable value of the land, as the resources and riches of the country are opened up and increased by the construction of railways. Thus, land in the neighbourhood of Gottenburg has increased cent. per cent. in the last ten years; and in the event of the expected union of Denmark with Sweden and Norway, when Gottenburg from its central position and advantageous sea-board, would probably become the seat of government and the converging point of numerous railways, must continue to advance in value.

The climate of central Sweden is delightful, the atmosphere being, in the opinion of old Australians, more clear, buoyant, and invigorating than that of their own settlement; and the scenery, without attaining to the wild grandeur of Switzerland or even our own Lake districts, is generally picturesque. The winters, though severer, are drier than ours; the weather in summer steadier and warmer; wet hay-times and harvests are of rare occurrence: and vegetation is so rapid that corn is sometimes sown and reaped in six or seven weeks. Nowhere on the face of the earth will an Englishman meet with more hospitable welcome and hearty kindness than in Sweden and Norway. I say an Englishman: for between the people of Britain and of Scandinavia there seems to be a mutual sympathy and bond of alliance, arising probably from the affinity, and, in great measure, common origin, of race, manners, customs, and institutions. In Scandinavia, alone, perhaps of all the nations of Europe, is England regarded with feelings where envy and dislike have no place; and to that quarter alone must her statesmen look, should ever be deemed desirable to for a powerful and enduring Northern League.

I have spoken of the steadiness and warmth of the climate in Sweden; yet with these advantages they adopt measures for the speedy drying of the crops, which might be copied with benefit in the rainy districts of these islands, especially where access can be had to the thinness of fir plantations. The most simple mode of drying grain is by rearing a number of light poles, about 9 feet high, in holes made for their reception by an iron crowbar. A pair of sheaves are placed upright against the pole to support the other sheaves, which are then linked two and two together and threaded upon the pole at the junction of the bands, so as to rest in a hori-

zontal position one on each side of the poll. The rest are similarly placed till the top is reached, where one sheaf is then impaled through its centre. In the districts bordering on the Baltic extensive frame-works are used. A number of fir poles, about 20 feet high and 4 yards apart, are erected in a row, usually running north and south. At each side of these poles, namely, east and west of them, and 2 feet apart from them, is erected a lighter pole, 1 foot shorter. Across each of these three poles are then nailed or pegged nine cross-bars, 2 feet apart, and two sloping pieces are placed at the top to support a roof, falling two or three feet each way. From each of these nine cross-bars to the opposite cross-bar are then laid four loose poles, generally of split fur, thus making between each pair of uprights a series of nine shelves, 4 yards long and $4\frac{1}{2}$ feet wide, on which the fresh cut vetches, clover, or timothy, or in wet seasons, grain, are placed and closely packed, and there remain till dry, proof against any damage from rains. It is of course necessary to prop against every other upright a sloping poll as a buttress: and this on both sides, unless when two parallel ranges are constructed a few yards apart, in which case it is sufficient to spur them on the outside, steadying them on the inside by a few poles stretched from roof to roof, and fixed at the ends as tie-rods.

A simpler and less expensive plan is in use in the western districts. Several couples of fir poles, about 8 yards long, are raised, at intervals of three or four yards, against each other, after the manner of a steep house-roof; the upper ends, which are pegged, cross or overlap each other sufficiently to afford a rest for the horizontal ridge-pole, which combines the couples. On the outside of these couples are inserted, at right angles to the slope of the pole, and 2 feet apart, wooden pins, about 8 inches long, to afford support for a series of loose horizontal bars, which are then laid from one to the other, thus completing the frame or rack. The laying on of the crop (which, whether of grass, clover, or grain, and however laid and twisted, is all cut with a short light scythe, which the mower wields in an upright position, cutting close to his feet) is then commenced by hanging the swathe over the lowest bar (which is two feet from the ground), till it reaches the next bar. The workman then stands upon the first layer whilst he fills the space between the next two bars, and so on till the ridge is reached, where a little straw or thatch is usually laid to turn the water. When grain is dried in this way the heads are put through the bars, the butt-ends being outside and inclining downwards; the whole resembling a thatched roof.

I fear that I have already trespassed too far upon your space, and remain, sir, your obedient servant,

WM. CARR.

Stackhouse, 18th Sept. 1862.

Town Sewage.

A good deal of light is thrown on the subject of town sewage, so far as the possibility of turning it to agricultural account is concerned, by the ordinary experience of the farmer.

1. It is the experience of the farmer that manure is just food *minus* growth, and that it is rich or poor according to nutritiveness of the food and the meagreness of the growth. He knows that the manure from store-fed growing stock is less fertilising and powerful than that from well-fed fattening-beasts. Now, man is one of the best fed of the "domestic animals," and inference seems unavoidable.

2. Although it is certainly true that we have nothing in ordinary agriculture corresponding to the immense quantities of fertilising matter which are thus poured over the sewage meadows of Edinburgh and Carlisle—nothing corresponding to the 300 animals in one case, 200 animals in the other, averaging probably 20 or 25 lbs. a quarter, whose waste is in these two instances applied per acre; yet it is undoubtedly the experience of the farmer that an increasing intensity of manuring is the rule, and is found profitable. Of that our columns have for several past weeks given ample evidence.

Mr. Hudson, of Castleacre, on his 800 acres of arable land, must use 40 tons of guano, 4 tons of nitrate of soda, and 25 tons of superphosphate and lime per annum, costing close on 20s. an acre over the whole of his farm. And besides this he consumes immense quantities of purchased cattle food, which goes to enrich the farm-yard dung. Mr. Howard, of Biddenham, Bedford, consumes £1,000 worth of cake and other cattle foods per annum, and thus enriches the manure of the stock on a farm of 300 acres of arable land and 120 acres of pasture. Mr. Paget, M.P., of Ruddington Grange, Nottingham, consumes 30 tons of cake and 200 quarters of corn, costing probably upwards of £500 or even £600, on 150 acres of arable land and 180 acres of pasture. Mr. Melvin, of Bonnington, Ratho, on a farm of 600 to 700 acres, spends £1,000 on artificial and purchased manures. Mr. Campbell, of Buscott Park, Lechlade, has found it profitable, after drainage, to apply $1\frac{1}{2}$ cwt. of Peruvian guano, 3 cwt. of superphosphate of lime, 1 cwt. of nitrate of soda, 15 bushels of bone-dust, and 1 cwt. of common salt per acre over his permanent pastures, and thereafter to feed sheep, five to eight of the large Lincoln sheep per acre, giving them cake in addition daily on the grass. This treatment has been adopted with great success over more than 1,000 acres of permanent grass. On an East Lothian farm of about 300 acres of arable land known to us, 18 tons of Peruvian guano, 12 tons of

bones and superphosphate, 6 tons of nitrate of soda, 3 tons of rape dust, and 3 tons of common salt are used, costing close on £400 per annum. On a farm of 280 acres of arable and 400 acres of pasture near Tavistock, Mr. Horswell applies 3 to 5 cwt. of Peruvian guano per acre to about 50 acres of swedes and mangels, consuming also with feeding cattle about 60 acres of barley and oats, about 25 tons of oil-cake, and 20 tons of bran per annum. The expenditure here must be £700 in cattle food, and £150 in artificial manures, on 280 acres of plough land.

These, then are ample illustrations of the fact that enormous quantities of fertilising matters are now commonly applied in English agriculture to the soil—that the soil is indeed being considered as a machine through which we put as much of the raw material of farm produce as by means of certain crops it will profitably convert, and that, therefore, there is nothing in ordinary agriculture to forbid the possibility of even the extraordinary supplies of fertilising matter which town sewers now for the most part send to waste being profitably used on a comparatively small extent of land.

3. It is the farmer's experience, moreover, that manure is more effective in the liquid than the solid form. If any one wants proof of that let him read Mr. Rustan's capital paper on the water drill in the 20th volume of the English Agricultural Society's Journal. Four to ten tons per acre of mangel wurzel, 30 to 40 per cent. of coleseed, a greatly increased produce of oats per acre, is obtained by the simple expedient of "flushing" in the manure that is applied at seed time with 3 or 4 hundred gallons of water to the acre. Another illustration of the advantage of putting manure in with water is seen in the superior efficiency which artificial manures exhibit in Scotland and the wetter climates of the island generally, as compared with their effect in the south-eastern drier countries. A third illustration of the same truth is found in the experience of the manure manufacturer and merchant, that a dry season is fatal to his trade. As a general rule, farmers do not buy these things until they are prepared to use them. And they know that it is useless to apply them in a dry state of the land and of the weather. The consequence is, we are informed, that nobody in the country uses the electric telegraph more than the agriculturist or his agent the local manure dealer, on any change of weather, as from a drought to rain, at this time of the year. The Thameside manufacturer is thus urged to the utmost, and superphosphates are sent off at the rate of hundreds of tons a day during the first wet week in April, May, or June, after a period of drought. It is undoubtedly also true that

extremely wet season is also injurious to the manure trade, but that is owing, not to such weather being injurious to the action of the manure (the contrary is the case), but to its hindrance of the work of preparation of land for the crops to which such manures are applied during this and the following month.

4. It is, however, the farmer's experience as a general rule that liquid manure is "more plague than profit." That this arises, perhaps, as much from his keen sense of its being a plague as from any well ascertained experience of its not being profitable may be admitted; for undoubtedly the use of the water cart enforced by the tanks being full at times when it is inconvenient to take the horses from other work—enforced too, at times when it is often unadvisable to apply manure to all; and, indeed, the use of the water cart at all—a new machine and new process altogether, hitherto unknown to ordinary agricultural routine—is felt to be a plague. Nevertheless, the profitableness of the process, considering the extremely diluted nature of the manure, and the labour of its conveyance in this way, is often doubtful. The fact is, water should be the carrier of the manure, not merely the thing carried. And the prejudice (shall we call it) which leads the farmer to condemn the practice of carrying it to the land directly as manure, as a regular part of farm management all through the year, will yield when the labour of it disappears, and its fertilizing influences are obtained under the system by which a dilute liquid manure is its own carrier in large quantities to the land over which it is proposed to take it.

5. But then it is the farmer's experience that tillage operations are necessary during the growth of many of our crops: that a dry, or comparatively dry, condition of the land is necessary during the ripening of seed; that land cannot be tilled and seed cannot be ripened except the soil be comparatively dry. This, then, shuts out from the possibility of benefiting by these large liquid applications of manure a very large number of crops. Whether grain crops will benefit by such dressings during the grassy stage of their growth has yet to be satisfactorily proved. At any rate, land cultivated for grain crops cannot be that constant scene of sewage operations throughout the year which land must be to take the constant supply of sewage yielded by towns throughout the year. And, indeed, this truth almost entirely shuts us up to the use of the grasses as the only plants to be cultivated under the influence of liquid and sewage manures applied in large quantities. There are among the grasses particular species which are endowed with extraordinary powers of growth, and consequently of absorbing food. What we want is a plant which shall have in

its natural constitution, as exhibited in our climate, a power of growth corresponding to the quantity of food which in sewage manure is applied to the land.

A good deal of evidence has been taken before the committee of the House of Commons on this subject, as to the power of soils to store away the fertilising ingredients of manure for future use. And so far as regards its application during the winter season, when the weather checks the growth of grass, a conserving power of the kind is, no doubt, useful.

But during the summer, the time of growth, what we want is not a soil to lay up these fertilising matters as supplies against a time of use. The summer is the time of use. And what we want is a plant which shall be capable of using the material as it arrives. For this reason, too, the manure as it reaches the plant must be capable of giving out its fertilising matter for its use at once.

That of it which is capable of feeding the plant must be in a condition prompting it to leave the water holding it in solution on the very slightest invitation, and indeed to leave it without any invitation at all. For we believe that the maximum produce of grass is obtained when the air immediately above the flowing water is capable of feeding the leaves beneath which it flows, at the same time that the water is feeding the roots. In Italian ray-grass we have a plant exactly of the kind required, so also in many other grasses; for the Craigentenny meadows, which yield such extraordinary produce of grass, contain little, if any, of the Italian ray-grass. It is in these grasses, then, and not in the soil, that we are to find the true machine for extracting the food which sewage yields. The mischief which it does and the nuisance which it is must be reduced to a minimum by turning it to use in this way in districts where the population is at a minimum.

The facts and arguments thus addressed to the reader must lead him, we think, to the conclusion that the sewage of great towns like London should be taken many miles away to where sandy slopes exist, over which it may be poured, and through which it will filtrate easily, and by means of which, or rather of the grasses which may thus be grown upon them, or rather of the cows which may be fed upon the grasses, the filthy stream may "by cleanly manipulation" be converted into milk.—*Gardeners' Chronicle*.

The Value of Food.

Abundant, nay superfluous evidence has been furnished to prove that no one principle of food will alone suffice for nutrition; but clear and unequivocal evidence is still wanting to show how far each principle of food is essential to life

and health, provided all else save that one be sufficiently supplied. This is a very different question. Again, ever since Liebig's classification of food into plastic or nutritive and respiratory or calorific, some most important questions in connection with it have engaged the attention of physiologists. Amongst them are these:—Is any food destined to the production of heat without being concerned in the repair of tissues—that is, is any portion of the food directly burnt in the blood? Is any portion of albuminous food directly calorific, that is, burnt in the blood without forming tissue?—Experiments were performed upon rats and a hawk. The animals were fed upon different diets, and the experiments may be divided into three classes accordingly. In one class the diet was a non-nitrogenous one, consisting of equal parts by weight of arrowroot, sago, tapioca, lard and suet; for this mixture was found upon analysis to yield only 22 per cent. of nitrogen. In another class the diet was a nitrogenous one. It consisted of lean veal from which every visible particle of fat had been carefully removed. This yielded upon analysis only 1.55 per cent. of fat. In the third class the diet was a mixed one. It consisted of a combination of the two former diets. From these experiments the following conclusions are drawn:—Nitrogenous materials are not only calorific, but, at least under some circumstances, sufficiently so to maintain alone the requisite temperature. It is in the highest degree probable that, under certain circumstances, nitrogenous materials may prove directly calorific without forming tissue. Non-nitrogenous substances are at least under some circumstances, directly calorific without entering into the composition of tissue of any kind. While non-nitrogenous food only is taken, all the nitrogen which is excreted in the urine, and more, may be accounted for by the disintegration of the original tissues, without assuming that any fraction is assimilated from any other source. While life cannot be maintained without nitrogenous food, even though every other kind be abundantly supplied, death in this case being due to loss of tissue, life and even health and the normal temperature can be maintained, at least for a long period, upon a diet almost exclusively nitrogenous, with proper inorganic substances in which there exist only a small fraction of non-nitrogenous matter. Such a minute proportion of fat must be but a poor representative of non-nitrogenous food. Moreover in these experiments some of the rats sustained a loss of weight considerably above 30 per cent. When their temperature is maintained from external sources, or when they are freely supplied with calorific food, warm blooded animals may die rather from waste than loss of temperature, as perhaps is the case with cold blooded animals when they are starved. Lastly, in these experiments the significant fact appeared, that while the

weight, strength and general condition of the animals varied very widely under the different diets to which they are subjected, no considerable fluctuation was observed in their temperature. Even the slight variation from time to time recorded seemed rather to result from other causes than to depend directly on the food.—*W. S. Savory, in Proceedings of Royal Society.*

South Australian Farming.

Among the several flourishing colonies of Australasia, that of South Australia seems to take the precedence in a purely Agricultural point of view. It not only sustains immense herds and flocks, but has been very successful in the cultivation of the cereals and root crops. Some of the finest wheat in the world has been produced in this, and the adjacent colony of Victoria. We are happy to hear of the prosperity of our fellow colonists in that distant part of the Empire, and our readers will be interested in the following article from the last numbers of the *Mark Lane Express*;

The last overland mail has brought us some interesting details from South Australia, which seem to mark the growing progress of this important and rising colony. The high position which it has recently taken by the awards conferred by the Jurors at the International Exhibition has led to a demand for information on the part of the public respecting its resources and present condition. The statistical details just taken in the colony furnish most *apropos* all that is required with regard to its land, crops and live stock.

From these official returns it appears that at the close of 1861 the total quantity of land alienated from the Crown, in South Australia, amounted to 2,379,048 acres, of which 1,393,672 acres were in the occupation of the proprietors themselves. As respects average price per acre, with the exception of 1861 which shows a little advance in price as well as in quantity sold, the sum realized has been gradually falling away for several years. Of late the acquirement of land has outstripped the increase of population, until at the end of 1861 the lands alienated from the Crown in this colony amounted to 182 acres for every man, woman, and child in the province. The lands alienated in Victoria amount to but five acres per head of the population; so that the people of South Australia own, in proportion to their numbers, nearly four times as much land as the people of Victoria. The average extent of holdings throughout the colony of Victoria in 1859 was 218 acres,

and the average number of acres cultivated by each holder is 26. We have, as yet no means of comparing these figures with those of South Australia.

We have before us a volume of Victorian statistics from 1835 to 1860. At the last mentioned date the "holdings" were subdivided into nine classes, viz, under five acres; 5 and under 15; 15 and under 30; 30 and under 50; 50 and under 100; 100 and under 200; 200 and under 300; 300 and under 500 acres; and 500 acres and upwards. Of the first class there were 786 holdings; of the second class, 1,674, of the third class, 1,241; of the fourth class, 1,206; of the fifth class, 2,199; of the sixth class, 2,087; of the seventh class, 1,140; of the eighth class, 283; and of the ninth class, 967. It will hence be seen that the largest number of farms in Victoria are those that range from 100 acres to 200 acres each, and the next largest those that range from 50 acres each, and the next largest those that range from 50 acres to 100. The holdings of 500 acres and upwards include all the purchased lands, and represent a wider aggregate acreage than all the other eight classes combined. The total number of all the "holdings" in Victoria was 11,573—(exclusive of town and village allotments): the total acreage of those holdings being 2,519,156; and the total of increase upon the foregoing figures. On the 31st March, 1851, there were, in Victoria, 2,076,014 acres of enclosed land not cultivated, against 1,388,160 acres in South Australia, enclosed but not cultivated on the 31st March, 1862. On the same dates the land under tillage in Victoria amounted to 419,380 acres, and as the people in South Australia exceeded the people of Victoria as landowners in the proportion of four to one, they surpass them as cultivators of the soil in the proportion of more than five to one. The Victorians, with their recent Land Bill and their permanent provision for immigration, are, however, trying new and important experiments, and we may expect to find the present great relative disparity between the agrarian interests of the two colonies gradually decrease.

The land fenced in, but not cultivated in South Australia, amounted to 1,388,160 acres, and exceeded the enclosed pasturage of the previous year by 236,984 acres. The number of acres under cultivation in the season 1861-62 was 486,667, against 418,816 acres in the previous season, an augmentation of 57,851 acres, or 31.5 per cent. These figures give 3.71 acres to each individual of the population; at the end of 1856 the rate per head was only 2.38 acres. Tillage increases at a greater rate than the alienation of the Crown Lands, 20 per cent of the land sold being under cultivation, against 19 per cent. in 1861, and 13 per cent. in 1856. Of the total land cultivated 310,636 acres or 64 per cent. was under wheat. The yield a-

mounted to only 3,410,756 bush. against 3,576,593 bush. in the previous season. This shows a deficiency of 2 bush. 5lbs. per acre, or over 400,000 bushels, had the yield been equal to the average of the year previous, although 36,994 acres additional were sown with wheat. The average yield throughout the province was but 10 bush. 59lbs, against 13 bush. 14lbs. in the previous year. This decreased production arose from gales and heavy rains in December, which shook out much of the grain, and laid the straw.

Another cause of the low average of the aggregate yield is, that much land was sown with wheat which was not of the description best suited for the successful cultivation in ordinary seasons of that cereal, a state of things doubtless owing to numerous small freeholders and tenant farmers being compelled, whatever the situation or the nature of the soil, to cultivate the crop, raised with the labour, and capable of being gathered by machine. More than two-thirds of the crops are reaped by machine in the colony.

Proceeding from the subject of the culture of wheat, which is at present almost the sole reliance of South Australian farmers, forming as it does two thirds of the whole cultivation, the next important crop to be noticed is that of hay, forming 13 per cent. of the tillage. 62,874 acres, principally wheaten or oaten hay, were grown, against 55,818 acres in the previous season—an addition of one-tenth, the produce amounting to 78,886 tons and 71,241 tons in the respective years. The average yield of the hay crop was the same in both seasons, or twenty-five hundredweight to the acre.

About one-tenth more land was planted with potatoes than in the previous year, 2,612 acres producing 7,726 tons in 1861-2, against 2,348 acres yielding 7,112 tons, the average produce being 59 cwt., or a hundredweight and a-half less than in the previous year. The above supply was insufficient for the local consumption; 2,450 tons, or nearly one-third more, having been imported at a cost of £13,419 for an article that could have been produced in the colony of equal quality to that imported.

The live stock returns show an addition to the number of all kinds of stock except horned cattle. There is an increase of 3,198 horses, making a total of 52,597; of which 47,434 are returned in the counties, and 5,163 in the pastoral districts. The shipment of South Australian horses to India and other ports during the past three years has obtained some importance, about 509 being the average number exported in each year. The decrease in the number of horned cattle is 12,831, a large falling off appearing in the number depasturing in counties; of which, however, there is difficulty in arriving at a correct enumeration. The total number in the colony is stated to be 265,533 head. Sheep

and lambs number 3,038,356 against 2,824,811 in the previous year, showing an increase of 213,545, or but eight per cent. in the year. The increase occurs chiefly in the more distant counties and in the other pastoral districts. The number of pigs has increased by 9,539, there now being 69,286 in the colony; notwithstanding, the imports of bacon, hams, &c., amounted during the past year to over seven thousand pounds value. Poultry of all kinds number 327,709. During the past four years the export of eggs alone has brought to the colony no less a sum than twenty-one thousand pounds.

Vine culture has attained such considerable importance in South Australia as to demand particular attention to the statistical facts elicited as to its position at the present time. The quantity of land planted with vines has increased rapidly. At the close of 1850 there were 282 acres; in 1854 409; 1856, 753; 1857, 1,055; 1858, 1,626; 1859, 2,201; 1860, 3,180; 1861, 3,918 acres. The number of vines was—in 1860, in bearing, 1,874,751; not in bearing, 1,948,510; total, 3,823,261. In 1861—in bearing, 2,361,574; not in bearing, 2,386,141; total, 4,747,715. The quantity of wine manufactured was in 1859, 182,087, and in 1860, 312,021 gallons. In comparing the quantity of wine made with the number of vines in bearing, it will be seen that only one gallon of wine has been obtained for each six vines. When the whole of the vines now planted will be in full bearing it is reasonable to expect that after deducting for the fruit, both fresh and dried, each vine will furnish a quart of wine, or a total of 1,186,404 gallons, being equal to 11,864 pipes of 100 gallons. Since 1856 the area of the vineyards has increased more than five-fold; and as during the last three seasons the number of vines planted has nearly doubled, those in bearing can form but a moiety, being the proportion shown above. The wine returned as made, is that produced in the season 1860-1, amounting to 312,021 gallons, an increase of no less than 129,934 gallons, or 70 per cent. on the quantity made in the previous year, viz., 182,087 gallons, and more than three times the quantity produced four seasons ago.

The weight of grapes sold or otherwise disposed of by the grower than in the manufacture of wine, was 23,229 cwt., against 23,398 cwt. in 1860-1; but it is probable that a large proportion of the grapes so returned eventually reach the winemaker, the purchase of small proprietors' crops by neighbouring vine growers possessed of better appliances for the manufacture of wine, being now carried on to some extent, to the manifest improvement in the quality of this article of colonial produce.

At Chicago, on October 30th, 7 grain-loaded vessels cleared for Buffalo, 3 for Port Colborne, and 8 for Oswego.

Agriculture of Colorado Territory.

The rich alluvial bottom lands of the Arkansas river are covered with a luxuriant vegetation, and wherever ranches have been commenced and farming labour expended, the results have been of the most satisfactory and profitable character. We were agreeably surprised to find such extensive improvements along the valley of the Arkansas.

The great objection heretofore urged against general agriculture in this region, has been the want of timely rains. This deficiency is now supplied by an extensive system of irrigation, and farmers find it even better dependence than rain, because they are able to moisten the earth at just the proper time, and to just such an extent as necessity requires. We have never seen finer corn anywhere than that grown this season on the Arkansas and Fontaine qui Bouille, and wheat, oats and barley have grown luxuriantly. All the other vegetable products have flourished bountifully, and the crops have in some instances yielded immense returns to their fortunate proprietors. We saw quite a number of wheat-stacks, which, on examination, proved to be equal to the best white winter wheat. The berry was plump and large, and the straw unusually fine. The yield per acre in some instances reached as high as forty-five bushels.

Ranchmen with whom I conversed, expressed their complete satisfaction with the fertility of the lands upon which they were laboring, and their entire confidence in the surety of a good crop, no matter how dry the season. Garden vegetables, melons, &c., are particularly prolific in yielding, and enormously large. At Fontaine City, at the south of Fontaine qui Bouille, we stopped an hour at the hospitable ranch of Mr. Leonard Johnston, and were regaled with the largest and most delicious watermelons and muskmelons we have ever eaten. Some of the former weighed fifty pounds. Other specimens of garden growth were exhibited to us, which would vie in size, quality, and abundance of yield, with the best ever produced in that celebrated region—Southern California.

As a grazing region, the rich bottoms and ranges along the Arkansas and Fontaine qui Bouille will compare favourably with any other portion of our territory. Stock raising is attracting the attention generally of the settlers, and already formidable herds of cattle and a few flocks of sheep are fattening on the hills. Another year and the farmers of this region will be enabled to supply in almost unlimited quantities all the vegetables and cereals for consumption in the southern portion of this territory. Fences are being built, ditches constructed, good comfortable buildings erected, and everywhere there is an air of enterprise

A thrift which characterizes all new and promising farming sections. Drouth is something which inspires no dread in the minds of the farmers of the valleys through which we ride. The facilities for irrigation are most admirable. Ditches stretching for miles in length, and carrying immense volumes of water, skirt the hillsides along the bottom, from which the grateful element can be diffused over thousands of arable acres at will. Timber, if not of the most superior quality, is abundant for fuel, fencing and building.

We do not wish in our remarks on this section, to be understood as disparaging any other agricultural portion of Colorado. All along the valley of the Platte, the Cache la Poudre, the elder, Thompson, Clear Creek, and a few other streams, extensive agricultural improvements have been made, and, we presume, with generally flattering results. But we have made special mention of our southern farming interests, because we have fortunately passed through that promising region at the time when the bountiful harvest was just gathered, and when we could see and appreciate the advantages and adaptiveness of our bottom lands for agricultural purposes. We are fully convinced that after another year passes, no wheat, flour, corn, bacon, or animal food of any kind, will be freighted across the Plains to this territory.—*Exchange*.

Weedy Neighbours

There are few evils afflicting agriculturists so much as can compare with the mischief occasioned in a well-farmed district by the presence of a neighbour who does not cut down his weeds. At the present season, in some parts of the country, the air is actually filled with thistle-down; and, keep land as clean as may, if one has a *dirty neighbour*, high as the wind, in its true sense, is labour in vain. We cannot even hold proprietors guiltless in this matter of disseminating weeds; for their woods and commons and warm millions of seeds are hourly winging their way to the garden-like farms of their tenants. Our columns mention was lately made of the institution of a Chamber of Agriculture. Now, then, is a fertile subject for immediate consideration, and one about which the Chamber could with good grace go to the Legislature for protection. In the colonies, our American brethren have long ago dealt with the matter in a business-like way; and particularly in the colony of Victoria, a very heavy penalty is enforced from any one who allows his weeds to go to seed.

Perhaps it may be thought by some to be inconsistent with British ideas of liberty and state rights, to interfere in such a case; but we cannot perceive the slightest injustice in

putting down such a nuisance; and a nuisance, in every sense of the word, it is. It would be invidious to mention individual cases; but we presume there is scarcely one of our readers who possesses a clear-kept farm, who could not at once point to some promoters of this evil, so rife at this particular season, and who does not fully sympathize with his brother-farmer who lives alongside of a "weedy neighbour." Commons in general, or seaside links, are often the great hotbeds and nurseries of this pest of thistles; and we have heard it mentioned that one in East Lothian supplies thistles for nearly the whole country. In the absence of the proposed Chamber of Agriculture, perhaps the committees of some of our agricultural clubs will put down for discussion during the ensuing winter the subject of "Weedy Neighbours;" and we shall live in hopes of seeing a short bill passing the House of Commons, compelling every one to cut down his thistles before they go to seed, and wing their flight to the farms of those who are compelled most unwillingly to receive them.—*Scottish Farmer*.

Use of Leaves.

In many sections of our country, oak leaves are extensively used as bedding for domestic animals. They are gathered in the forests in autumn, and stored in some convenient place till wanted. This affords them time to dry, which increases their power of absorption, and renders them more valuable in taking up and preserving the liquid voidings, and also facilitates, through this means, the decomposition of the vegetable fibre when used as a manure. That oak or other kinds of leaves, operate powerfully when spread broadcast on the surface of mowing land, is unquestionable; yet this results not so much from the "astringent" matter they contain, as from the non-conducting power. We spread leaves around the trunks of trees, the blossoming of which it is desirable to retard in spring, we apply them also in "mulching," the object of which is to retain the moisture in the soil for the benefit of trees newly transplanted.

When they are spread upon the surface of grass lands, they present, to a very great extent, the action of the solar rays, and thus in a measure deprive the roots of the energizing and vitalizing influences upon which their strength and vigour very essentially depend. Whatever may be the effects produced by leaves, in their crude state upon cultivated vegetation, we see that they are eminently useful in woodlands, where, if they are removed annually, the growth is not only greatly retarded, but arrested.

In compost, also, we may often see the value of leaves tangibly exemplified, for experience has long assured us that few more really valua-

ble accessions can be made to the compost heap or yard, than that obtained from the forest. In the cultivation of young fruit trees, this species of dressing is now greatly valued. From one to two years are required to prepare them for this purpose according to the particular use to which they are to be applied. Any kind of forest leaves will be found valuable for this purpose. All that is necessary is to afford them time to decompose. The foliage of the alder, bass, poplar, willow and other similar trees, is more readily decomposed than that of the elm or oak; but they possess less consistence, and consequently tend less to the increase of the compost heap.

The fact is now generally well understood by practical agriculturists, that the aliment of vegetables, technically denominated *Humus*, is best produced from that class of substances from which plants derive their food. The process adopted for elaborating this important material is attained in a variety of ways; but the most direct method is by the application of substances of an animal or vegetable character in a state of active putrescence or decay. We of course, are speaking now of organic manures, and in the list of materials shall embrace *leaves*. These, in addition to their organic constituents, possess also matters of an inorganic character no less essential to plants in a growing state, than the former. To illustrate this point somewhat more fully we present an analysis of leaves of the "Early Harvest Apple." The leaves were collected September 30, the tree bearing fruit:

Silica	5.775
Earthy phosphates	
Phosphate of peroxide of lime	4.875
Phosphate of lime.....	1.416
Phosphate of magnesia....	trace.
Silica.....	5.125
Phosphoric acid.....	5.359—76.775
Lime	36.398
Magnesia.....	0.075
Potash	13.179
Soda	11.616
Chloride of sodium.....	0.060
Salphuric acid.....	0.137
Carbonic acid.....	15.200
Organic matter.....	2.850
	<hr/>
	101.065

PROPORTIONS.

Water.....	54.341
Dry	45.659
Ash	4.194
Calculated dry.....	9.163

—N. E. Farmer.

Temperature of the Earth Under Sod and Under Cultivated Surface.

The writer was recently a listener to an animated discussion between two excellent gardeners. One insisted that the earth was drier and warmer

under sod than under loose earth. The other argued on the contrary. Each was sure the other was wrong, and each appealed to us "There is a Thermometer, we replied, "why do you not go and try for yourselves?"

How strange it is that men will argue for years on the most simple questions, when but five minutes of actual experiment would often decide the matter at once and forever! How true it is that a large amount of misunderstanding often leading to the most disastrous issues, not only to individuals, but to whole communities arises from imagination being mistaken for fact and hasty assumption misplacing cool perception. In our schools most of what we are taught might come under the head of "what to remember; but how much better would it not be if the system was "how to observe and consider?" We cannot help making these reflections, as, in our department of education—horticulture,—we find this injudicious course of education opposing our progress at every step. But to the temperature experiment.

It was mid-day on the 26th of August, at the thermometer, in the shade, under a tree, five feet from the ground, was 92 degs.

The first spot selected was in a very hot place on a lawn, where the grass was kept mown pretty close by a scythe. A spit was dug up with a spade six inches deep, the thermometer inserted, and the sod placed on immediately. After a few minutes, the thermometer was found to mark 88 degs. Ten feet from this spot, the same full sunny exposure, was a flower-bed kept clean by the hoe and rake. The thermometer was here inserted as before, and found to be 96 degs.

A more exposed place was then chosen, on a hill, where a boundary once divided a pasture from a cultivated piece of ground, used as a nursery, on which three year-old apple trees were growing. Four feet from the fence, in the sod, the thermometer was again tried as before and the result was 80 degs. The same distance in the cultivated lot, tried in the same way, gave 88 degs.

It was evident from these two experiments, tried in the coolest and in the warmest spots that could be found, that the relative difference in the temperature was uniform, and the result is, that on a hot summer's day, the earth, four inches under surface in sod, was eight degrees cooler than under a clean, loose surface.

It seems to us that this fact, if found to be universally as it was in this particular instance ought to have an important bearing on the discussion of many important horticultural questions—such as whether orchards as a rule, better in grass or not, for instance—but it is not our object here to enter into such questions. We wish now merely to call attention to the want of more observations and less opinion and to show the result of such an experiment, in a single instance.—*Gardeners' Monthly*.

On the Selection of Seeds of the Cereals.

In every field of grain there are to be seen ears differing in size, in form, and in general appearance from those growing beside them. Some of these can be recognised as the ears of established varieties, but a few will be distinct from all the kinds in cultivation. Farmers usually pay little attention on the different kinds of grain which may be sometimes seen growing in the field, and which can be best observed during the cutting and harvesting of the crop; but the farmer in a thousand would undertake the selection of such ears with the intention of sowing the seed, and thus propagating the kinds. A number of varieties would be considerably increased, and the kinds in cultivation would be improved by this selection of the best ears. Persons who intend to collect ears of one or more of the cereals should proceed methodically, not only when selecting, but in keeping the ears of apparently different kinds distinct at the time of gathering them, so that each kind can be known by itself, and the produce from the seed of the selected ears collected and stored for the sowing. During the time of selecting, small bags formed of cloth should be used, and as the ears are separated from the stalks they should be placed in one or other of these bags. Care should be exercised to prevent confusion and intermixing of the seeds.

Every circumstance should be noted at the time, such as the field of grain in which the ears were gathered; the characteristic features which the ears presented in growing, such as size, form, whether the ears are close or open, and the color of the chaff and straw, chaff smooth or downy, and other points deemed worthy of being recorded. A written description should be placed on the ears put into each bag for after reference, as it is seldom advisable to trust to the memory as to the facts. The bags containing the ears should be hung in an open place away from mice or other depredators until the period of sowing the seeds.

When it has been determined that the sowing of the seeds of the selected ears shall be proceeded with, a plot of ground near to the entrance of the field can be chosen, the remainder of the field to be seeded with grain of the same kind, whether wheat, barley, or oats. Small plots can be formed by a hand hoe, the seed being sown, and the earth returned by a hand rake, the seed being lightly covered. Each plot should be marked by a piece of wood placed at the end of the rows and the number marked on the wood for after reference. A note book should be used for inserting the facts connected with the selecting of the ears, the sowing of the seed, the appearance of the different plots presented at the time of braiding, tillering, earing, blooming, ripening, with dates and other particulars.

The amount of trouble which the propagating of varieties entails renders it advisable for experimenters not to attempt too much at one time. Only those who are resolved to bestow minute attention during the whole period from the time of selecting the ears until the quantity of grain produced admits of its being distributed, should undertake the selection of ears for propagating the variety. In propagating new varieties, constant attention is essential to keep the variety true to the kind selected, more particularly if it has originated in what is termed a sport, either the result of cultivation or hybridization—the pollen of the ear or one variety fertilizing the seeds contained in the ear of a different kind. This hybridization is sometimes effected by experimenters, but accidental contact is the more frequent cause of the sports which appear in cultivated plants. Every variety of grain in cultivation will occasionally show ears differing from those which possess the characteristic appearance of the variety, while some varieties show red or brown ears, and ears with and without awns. The higher the manurial condition of the soil, the tendency to sporting appears to increase in force. As the soil should be made rich in which the seeds of the selected ears are grown year after year, this tendency to sport is certain to appear, and as the propagating of the selected variety is proceeded with, constant care is essential to cull out the ears which differ from the original standard of the selected ears. If the variety is the result of hybridization, this culling is all important.

The ears will differ considerably in appearance, some resembling the kind from which the fertilizing pollen was derived, and others more closely resembling the variety which the pollen fertilized. Uniformity is essential to entitle any grain to the term variety, and this uniformity can only be secured by constant care in selection. After the type becomes fixed, sporting and degenerating will almost wholly cease, provided ordinary care is taken by the propagator. But every established variety should be kept up by occasional selection of the best ears.

In an industrial point of view the propagating of a new prolific variety of any of the grains is of immense national importance. Any new variety which would yield from one to four bushels of additional grain per acre over the ordinary varieties in cultivation would tend thus far to raise the resources of our own soils. In this direction an extensive and most inviting field is open to all cultivators. Were agriculturists to study more closely the operations of horticulturists, much benefit would result to all. Farmers generally not only undervalue, but wholly disregard what horticulturists have done for agriculture. As well said by the highly distinguished botanist Dr. Lindley, in a recent address to Prince Albert, as President of the London Horticultural Society, "Horticulture, sir

is the parent of agriculture. It determines, on a small scale, the value of the principles on which an extended cultivation of the soil depends."

In garden vegetables, in fruits, in flowers, in shrubs, immense progress has been made within the past few years, mainly the result of propagating new varieties. In all departments of horticulture the exercise of skill and untiring perseverance is apparent, and should be an incentive to agriculturists to follow in the same path.

The pleasure, and in exceptional cases the profit, to be derived is so considerable that the propagator of new varieties will generally be amply rewarded for the time occupied in conducting the various operations of selecting, sowing, and reaping new kinds of grain. These farmers who are anxious to improve the varieties of grain in cultivation—wheat, oats, or barley, should adopt the same means as some so successfully followed out by horticulturists—hybridizing, and more especially by selecting the best ears, and growing the seed so obtained until sufficient quantities are secured to seed considerable portions of land preparatory to disposing of a portion of the seeds raised from the selected ears. The improvement of the domestic animals and birds has been mainly effected by selection, and the same principles are equally applicable for the improvements of the various varieties of the cereals in cultivation. This field of experiment is open to all, and the persevering may calculate upon success. Where so much can be effected with even an ordinary amount of attention, the experimenter who possesses a knowledge of the cereals, and also of vegetable physiology, is certain to reap a good harvest.—*North British Agriculturist.*

Agricultural Intelligence.

The Michigan State Fair.

The *Prairie Farmer* of October 4th observes:

The 14th annual fair of the Michigan State Agricultural Society was held at Detroit last week, and proved a complete success financially, and presented an array of articles and animals in the different departments that entitle it to a fair comparison with the most successful ever held by the society.

The opening day closed with a heavy thunderstorm, quite flooding the grounds and dampening the ardor of the members and exhibitors somewhat, but the second morning broke cool and clear with promise of fine weather which held good. Departments filled rapidly and the people turned out.

The attendance was very large Wednesday and Thursday. Parson Brownlow addressed an audience of about 15,000 on Thursday afternoon with a recital of personal adventures before leaving Dixie land—he was cordially received.

Horse Department.—The entries were numerous, but enough well known stock entered to attract great attention. Among them "Mag Charta," "Fanny," a celebrated trotting mare and many others of local celebrity. Seven excellent spans of matched horses were on ground for carriage and general work. Jags and mules were more in number and better than ever, showing the attention paid to this branch. The government demand for both horses and mules will tend to remove very many ordinary horses and their place will doubtless be filled with a better grade of stock if we may judge by the feeling shown among horse men and farmers.

Cattle Department.—The number of animals entered was large, comprising Devons, Puffs and grades. There were a good many fat cattle, some very noticeable ones. One especially, fed by Mr. Smith, Detroit, weighed over 3,200 lbs. The herd of Messrs. Crouse, Hatland, in part of imported stock, was very fine, and contained animals of much promise. The Messrs. Sly of Plymouth, noted breeders, had a fine herd. Several others from Ohio and Canada, showed good herds.

Sheep Department.—Here, as at Cleveland the Vermonters appeared in competition with local breeders and growers. The home exhibition was not what Michigan can or ought to have made. The show was made up of Leathers, South Downs, French and Spanish Merinos. There is a large demand now for sheep corresponding to the government demand for clothing and want of cotton, and prices have largely advanced the past season. Large prices are offered for fancy sheep. We would caution those desiring to commence to be very careful of whom they buy high priced sheep, that I do not suffer as many in the west have heretofore done.

Implement Department.—Anything that lessens the labour of the farm, and in part meets the demands for the labor of those who have volunteered, gave this department especial prominence, and the usual number of new inventions, practical and impractical were shown, the proprietor of each demonstrating what fortunes be made or saved by their adoption. Reapers and mowers were well represented. R. L. Hard, of Buffalo, N. Y., showed the Ketch Reaper and Mower. The former has a very ingenious simple raking attachment, which the driver can operate with one hand, while the other drives with the other, or it can be so arranged as to be worked by the machine—the cost of the attachment is about \$10 for a hand reaper, and can be attached to any reaper. He also showed an attachment to the reaper for cutting

n. The grain platform and cutter bar is ed, and a shorter one put in its place with aped hopper for the corn to fall into as When enough for a bundle is cut, it is ei out upon the ground. It seems as it would work well. With slight altera- it could be made to attach to most ma-

Buffalo Agricultural Machine Works had eition the Kirby Machines—the reaper eeh had a self-raking attachment, and ope- at the will of the driver to lay off bundles of size, etc. The arrangement was very in- Its cost, attached to the machine, e from \$25 to \$30. They have been d only the past season.

Drills.—Thomas Mast & Co., of Spring- Ohio, showed their Buckeye grain drill, e grass seed attachments. The popularity of ill may be judged of when it is known that e make and sell more drills than any one e in the States.

Win, Dewitt & Co., of Cleveland, Ohio, showed the Star Drill, a very excellent e; and finely finished, its arrangement e ing insures a very even distribution of e and prevents all clogging from foul or e seed. Each of last two firms also showed e cider mills, of which they make large e ers.

Puller —Daniel C. Smith, Adrian, the who used to show a corn-husker at our e has invented and showed here a powerful e puller, capable of raising 1,000 tons e at with one team, it weighs 3,000 lbs., and eged upon a pair of wheels for moving e field to field or stump to stump. It is e combination of pulleys, lever and shears. e plate for use with ropes and chains it costs

Products.—This department was almost e neglected. A few vegetables, a dozen or e of wheat, three or four cheeses, very e butter, a few loaves of bread, are the princi- e plements; long ranges of tables were entire- e empty.

Hall was better filled, but nothing com- e to what Michigan is capable of doing. e grapes were shown by several, together e some splendid lots of the Concord. The e rare was also shown by some half dozen e eat ones. The show of Pears was very fair, e so that of apples. This department was e in the charge of T. T. Lyon, Plymouth, e a prominent Pomologist of that State.

lural Hall was very finely arranged with a e plain and fish pool, filled with various fish- e in the centre, and surrounded with a grass e ar, as were other departments where plants e bedded in the earth and kept their fresh- e throughout. Cut flowers were arranged e tables and shelves to good advantage. A e of this building was given up to seving e lines and pictures.

Manufacturer's Hall.—The show here was e meagre, and embraced but little that was e specially noticeable, except the specimens of Sagi- e naw salt which is now attracting so much at- e tention in the country.

The receipts of the Society enabled them to e pay their debt, (about \$2,000) pay all premiums, e and will leave a fair surplus. This, in war e times, was unexpected by many.

Kerry Cattle.

A correspondent of the *Prairie Farmer*, who e has been visiting some of the fine places in the e vicinity of Boston, gives some account of the e Kerry cattle belonging to Mr. Austin, of Rox- e bury, purchased for him in Ireland by Sandford e Howard, Esq. The original importation con- e sisted of six heifers and a bull; and the herd e now owned by Mr. Austin is believed to be the e only one of this breed in our country. The e exportation of these cattle to America caused e quite an excitement in Kerry. The Kerrys are e usually jet black, though an occasional one of e some other color is seen. Their prominent e characteristics seem to be; a hardy constitution, e the economy with which they are kept, and e good milking qualities of the cows. In size they e are about equal with the Jerseys, in form com- e pact and symmetrical, combining the fore quar- e ters of the Devon, with the hind quarters of the e Durham. They seem to be well adapted to the e farms and cottages of their native country, and e if they were common in this country and regard- e ed less as *fancy stock*, they would be well suited e to our hilly patures and severe winters. The e writer alluded to above, says:

"They are remarkably gentle, and their hair e is uniformly very thick, showing their ability to e withstand the severest of winters without shelter.

Mr. Austin has experimented with them upon e different kinds of pastures, and expresses the be- e lief that they are emphatically the "poor man's e cattle," yet it is likely that they will be monop- e olized by the rich for some time to come. e Whilst I will say they are exactly the breed of e cattle for the mountainous pastures of New e England, I will also say that if I lived out in the e open prairie, had no barn, and could keep but one e cow, I would prefer a little black Kerry Cow to e all others."

Sale of Mr. Sanday's Leicester Sheep at Holme Pierrepont.

The great sale of sheep from the justly cele- e brated flocks of Mr. Sanday took place on e Wednesday, and drew together a large attend- e ance of breeders and flockmasters from the Con- e tinent, as well as from every part of this country. e Mr. Strafford officiated as auctioneer. The pens

comprised 36 rams and 245 ewes, almost all of them either prize winners, or animals which had been highly commended at the principal show in the United Kingdom. This superb flock is now being dispersed over the world. Some of the animals have gone to Australia, others to America. The Minister of Agriculture in Spain has secured several, and in other countries the esteem in which the Sandy breed of Leicesters is held has been testified to by the numerous purchases at high prices which have made at the several sales held at Holme Pierrepont. On Wednesday, large purchases were made for Austria and Prussia. Of the shearing rams, one went to Mr. Princep, of Newton Regis, for twenty seven guineas; another to Mr. Henry Mann, of Lutterworth, for twenty guineas; and a third to Mr. Massey, of Hurlton, for ten guineas; and a fourth to Mr. John Spencer, of Dunnington Park, Melton, for the same price. For a three-shear, Colonel Inge gave thirty-eight guineas; and for another Mr. T. Harris, of Stony-lane, Bromsgrove, gave twenty-one guineas; while a five-shear fell to Mr. Spencer of Clay brook, Lutterworth, for twenty guineas. A lot of five ewes obtained fifty guineas from Mr. Cresswell, of Asby-de-la-Zouch; another, thirty-five guineas from Mr. Dean Derbyshire; a third, the same figure from Mr. Dabbs, of Seckington; two others, forty-five guineas and thirty-five guineas respectively from Colonel Inge; one twenty guineas from Mr. Pester, of Tamworth; and a lot of four, forty guineas from Mr. Cresswell. A lot of five shearing ewes was knocked down to Mr. Horsfall at eighty-two and a-half guineas, their destination being Koingsberg; another at thirty-seven and a-half guineas to Mr. Hurlburt, for Prussia; and another for eighty-five guineas to Mr. Fortescue, Aberdeen. Summary of sale: 37 rams £688 16s.—average, £18 12s. 4d.; 174 aged ewes, £1,026 7s. 6d.—£5 18s.; 71 shearing ewes, £500 6s. 6d.—average £7 1s.; total sale, £2,215 10s. Average of 245 ewes, £6 4s. 8d.; total, £1,526 14s. 72 rams sold July 9, 1862, £1,905 15s.—average, £26 9s. 4½d.

LORD POLWARTH'S FLOCK.—This celebrated flock, which has long commanded high prices at the great Kelso sales, and whose strain is distinctly traceable in the flocks of almost all the best breeders of pure Scotch Leicesters in this country, originated in 1882, when 80 ewes were purchased, £2 15s. each, from a well known Northumberland breeder, Mr. Jobson, of Hidgley, near Chillingham, and 140 ewes from a Mr. Waddell (also, we believe, a Northumbrian breeder), at £2 14s. Where the rams were obtained from it is now somewhat difficult to ascertain. At that time, however, the most reputed breeders did not care to dispose of their rams, and it is probable that these were hired from the most famous Border flockmasters, of whom Mr. Robertson, of Ladykirk, was one.

Two years after Lord Polwarth had purchased the flock from Mr. Jobson, he commenced a series of rams at Mertoun; and from that time, continued them every year at that place. In 1852, when he sent his rams down to Leith, were they have ever since been sold. This it will be noticed that his Lordship realized the average £8 11s. 2d. per head more than Mr. Stark, of Mellencann, whose stock made the next highest average. We believe that the esteem in which Lord Polwarth's flock is held is due to the fact that the blood has been perfectly pure during the half century he has been a breeder; whereas many other of the best breeders, in a desire to improve their flocks, some ten or fifteen years ago introduced a Cotswold element, with an effect opposite to what was intended. We have been unable to obtain the average prices of Lord Polwarth's ewes during the fifty eight they have been disposed of by auction, but the following averages will show how they have been gradually growing in value: 1830 35 at an average of £3 15s.; 1840, an average of £5 11s.; 1853, 40 at an average of £6 18s. 10d.; 1859, 44 at an average of nearly £7 1s. 1d.; 1860, 43 at an average of nearly £7 1s. 1d.; 1862, 38 at an average of £18.

SALES OF SHROPSHIRE SHEEP.—Almost last, but far from the least important of the ram sales was held on Wednesday in last week at Grendon, near Atherstone, when Mr. John Lythall, the Secretary, of the Birmingham Cattle Show, sold and let thirty-five shearing and other rams, the property of Mrs. Baker, at an average of nearly £10 each; and also disposed of fifty ewes at 52s. per head, and like number of heaves at 63s.

The annual sale of Earl of Dartmouth's celebrated Shropshire rams and ewes took place at Patsball on Friday last, and was attended by several of the leading flockmasters of this and the adjoining counties, and went off in a spirited and satisfactory manner. At one o'clock the company sat down in a splendid mansion erected for the occasion, to luncheon. At past two o'clock the business commenced under the hammer of Mr. Nock (of the firm of Nock and Wilson, Bridgenorth), when ninety store ewes were sold, averaging £2 10s.; ninety yearling ewes made an average of £2 3s. The rams also with good competition, reaching as high as £12 and thirteen guineas. Twenty-one were sold at an average of £8 5s.

AUTUMN SHOW AND GREAT SALE OF THE KELSO.—On Friday the Autumn Show of the Union Agricultural Society and the Great Annual Top Market took place in the Poor-House Field, and was a great success. The prize animals were, as usual, scrutinized with much interest by the farmers present, and it was universally admitted that the awards of the judges were given with the strictest impartiality. During the day the show-grounds were visited by

the Duke of Roxburgh, President of the Society; Lord Polwarth and the Master of Polwarth; Mr. Grant Suttle, Mr. Prescott, Mr. Grant, of Cowdenknowes, &c., &c. The gentlemen who officiated on this occasion were—for Leicesters, Mr. F. P. Lynn, of Mill; Mr. Thomas Cockburn, of Menzies; and Mr. Melvin, Bonnington. For Cheviots, Mr. Clay Winfield; Mr. John Douglas, of Swinside Hall; and Mr. Andrew Douglas, Swinside Hall. List of premiums was as follows:—Leicester: For the best shearling tup of the pure Leicester breed, Mr. Simson, Courthill, £5; for the second best, Lord Polwarth, £3; Mr. Torrance, commended. For the best shearling ewe, Mr. Simson, Courthill £3; for the second best ditto, Mr. Roddam, of Roddam, £2; Mr. Perres, Linton Burnfoot, commended. For the best tup of any age not exceeding four shear, Mr. Simson, Courthill, £3. For the best pen of Leicester gimmers or shearling ewes, Mr. Haymount, £3. Cheviot Sheep: For the best two tups of the pure Cheviot breed, not once shorn, £5; and for the best tup of the same breed, not above thrice shorn, £3, Mr. Hindhope; for the second best ditto, Mr. Clarke, Ilderton, £2; for the best pen gimmer of the same breed, Mr. Elliot, Hindhope,

Horticultural.

Light in Plants.

This light may be classified into two kinds, the first continuous, mostly phosphorescent; the second, in the form of lightning.

Decaying wood belongs to the first. A fungus (*Byssus phosphorea*, L.) has till lately claimed the credit for it; but Betzius Von Humboldt and Bishop Argadh (another Swede) are in ascribing to the wood itself the faculty of shining.

Any kind of wood, if we believe Dessaignes, gets phosphorescent under certain conditions—viz., a proper degree of decay, thermometer 46° to 53°, sufficient dampness and spherical air. We find it, however, most with alder, beech, white pine, and willow. They shine before actual decay, but moisture rules the intensity of the light—the more moisture the less light; no moisture, no light. Where the shining has ceased it can be restored by a little water thrown on the wood, and by enveloping it with paper or glass.

Temperature, we believe, is of no account so long as the thermometer does not exceed either the boiling or the freezing point, as in either case the water would disappear.

But not decaying wood alone has this phosphorescence; other parts of plants have it

when decaying. Thus Meyer tells us that, wandering by night through a forest he found decaying mushrooms in a phosphorescent state, and that he took up the shining matter with his stick and rubbed it against trunks of trees.

Tulasne has given us a very interesting treatise about the shining of dead oak leaves. Moisture is in every instance a necessary condition. Of all things, however, it is the dipteris which is best known for its remarkable and beautiful light circling round the whole upper part of the plant, when, after warm and calm days, a match is brought near it. It is the æthereal oil evaporated by the plant which burns, and makes it appear as if the atmosphere round the plant was in a mild blaze. The beauty of this phenomenon is worth trying it, and enduring the failures which an unfit condition of the atmosphere will often bring.

Less strong than the dipteris, but stronger than decaying wood, shines the milky sap of *Euphorbia phosphorea*. Martins, during his travels in Brazil, found it to shine mostly when a storm was coming on. He also relates that he was told by the natives of an *Euphorbia* growing in impenetrable thickets of several thousand square feet, which often spontaneously ignite, emit a column of smoke for a while, and ultimately blaze in a clear flame.

But not dead matter alone has this phosphorescent quality. We find it in living plants—for instance, *Rhizomorpha subterranea*, a fungus found on decaying trunks or on timber used in moist mines, emitting light from the tops of its branches so strong that, according to DeCandolle, you can see to read by it; or *Agaricus olearius*, a fungus growing on the olive tree, which shines best when vegetation goes most forward, and which fact Tulasne therefore calls “une manifestation de l'activité de sa végétation.”

The cause or causes of the phosphorescence of these plants has not been found. A very long range of experiments under all temperatures and at the various stages of vegetation would be required. This explains also why the statements of botanists differ so much—why one has never found that such and such plant has emitted light; why the other asserts that only the lamellæ of different fungi had it, &c. We must, however, here mention a no less interesting phenomenon than either of those already stated. It is offered to us by *Shistostega osmundacea*, a moss growing in caverns and grottoes, which in day-time is in a state of lucidity similar to the *Smaragd*. In this instance the structure of the plant, as the rays of the sun refracted on it, seems to be the cause, though we would not like to vouch for it.

We would rather speak now of the second class of light in plants—namely, where that

light appears in the shape of lightning. And the first observation it appears has been made by Linnaeus's own daughter, Elizabeth Christine, who found that one evening in the year 1762 the orange flowers of *Tropeolum majus* produced a kind of lightning; that is, the flowers seemed by fits and starts to dash light. She ran to her father, not believing her own eyes; but the phenomenon had disappeared when the father came, and what he had never seen or heard of he would not believe in till he had seen it himself. On subsequent evenings, however, he himself witnessed the fact, whereupon he asked his daughter to make a report of it to the Royal Academy of Sciences. This report has been accepted, and exists on the record. We are sorry that we have to add that neither the great Linnaeus, nor his daughter nor Linnaeus's son, nor any one of a great many chemists and botanists who undertook to study the matter, could to this day succeed in telling us anything better than suppositions, which were hardly uttered before upset by themselves, and amounted to nothing. If the stirring-up of observations, the reiteration of facts, the discussion of probabilities, can ultimately lead the investigating mind to the

true cause, then there is hope for our enlightenment. But as we doubt that, and will weary our readers, we will, before we close this article, tell them that electricity is not to have anything to do with these phenomena; that orange colour of high intensity and fire seems to have a good deal to do with it; that weak eyesight does not do it, as Linnaeus naively says, and that his daughter, Lector Haggren (at Swede) noticed it in the year 1788 on *Cedula officinalis*, *Lilium bulbiferum*, *Tagetes patula* and *erecta*, also, but slightly, on the orange variety of the flower, *Helianthus annuus*. Lastly comes Fries, and tells us that he was induced to write his essay on light in plants by one walking about in the botanical garden (Upsala) and seeing lightning shooting up from an isolated growing plant of *Papaver orientale*, strangely enough after having passed a large group of them without seeing anything that he then led other persons past who not know of it, and that he then began to study the light in plants. May he be able to enrich science with the knowledge of its causes.—*Gardener's Monthly*.



The Hyacinth.

BY MR. WM. PAUL, NURSERY, WALTHAM CROSS.

Of the many candidates for popular support in the present extended list of garden favorites there are few receiving more attention at the present time than the Hyacinth. Its beauty, fragrance, and variety are so many points of attraction, and the season at which it blooms is worthy of especial consideration. By the appearance of the Hyacinth winter is driven from

its last strongholds, and the garden suddenly rejoices in all the brilliancy of a summer party. Then the plant is of such easy culture, that the highest attainments in the art may be reserved for the patient exercise of skill and industry. The "prentice hand" in gardening may reasonably expect to attain to fair and satisfactory results. In a word, the plant is more manageable than many of its competitors, and hence it is less fear of failure from the oversight of an unskilled horticulturist knows so well when

to apply. In treating of the culture of the bulb three separate points occur to me:—1. The possession of good bulbs; 2. The season of planting; 3. After culture; and these I proceed to discuss separately.

GOOD BULBS.—The best Hyacinths are imported from Holland. A more beautiful bulb could scarcely be conceived than the garbanc and around Haarlem in the spring and summer months, with their acres of ground, and with millions of Crocuses, Tulips, Hyacinths, blue, white, red, and yellow, of the richest and most varied hues, the more grateful to the eye, and the more impressive, because following so closely on the footsteps of winter. As is well known, the culture of the Hyacinth and its allied species is a speciality in Holland. I do not see why it should not be the same here, as the differences in some localities, climates, and soils would appear to me insufficient to account for its not being so. Perhaps our horticulturists are much occupied with other matters, and it might be commercially unwise to enter the field against such skilful and indefatigable contemporaries without first acquiring a practical knowledge of so distinct a branch of the art of gardening. We may, and I believe we do, rear and bloom them as well here as there. The question remains, can we bring bulbs of equal quality into the market of the same quantity and at the same price? The answer is, not generally. We can, in the present state of our agriculture and practice, buy and sell cheaper than we can produce.

The Hyacinth being a bulbous plant, the source of supply, at least during the early stages of its growth, depend on the nutriment stored up in the bulb the year before. Thus it will be seen that it is as important to obtain good bulbs as to grow them well when obtained. And therefore caution the cultivator against placing too much confidence in large bulbs. True, a large, sound, solid, weighty, and well stored bulb is sound food, the larger the better; but we see many large, showy, frothy bulbs sold in Holland and in England which fail these tests, and which it requires a practiced hand to apply. Then again, there are beautiful sorts of Hyacinths—of which the most familiar example—which seldom produce large handsome bulbs. On the other hand, there are some indifferent kinds which produce bulbs of great size and beauty. In other words, bulbs of the same kind differ in the hands of different cultivators. In fact, if it were not for this, we need only adduce one fact—and that is, that it can be attributed to the greater skill of the cultivator or to the superiority of his soil, and not to the soil—remains—that there is a difference of opinion in the prices of the different growths, and that the highest priced stock always comes from the readiest market. Having laid the foundation of a successful culture by the acquisition of good bulbs, let us pass to the next

2. **THE SEASON OF PLANTING.**—The natural period of rest for the Hyacinth is from June to October. If planted before the latter month, the shortening of the natural period of rest diminishes the vigour of growth and the beauty of the flowers. So if the planting be delayed far beyond that period, however well the bulbs may be kept, growth commences, the bulb feeds on the deposit of the previous year contained within itself without the means of recruiting the supply, and a loss of power is the consequence. Plant, then, in the month of October, applying a greater or less degree of heat, according to the season or seasons at which the flowers are wanted. If a very early, a very late, or a long succession of bloom be required, some should be planted earlier, and some later; but the month recommended above is the best, if the finest possible bloom is required, without regard to any definite period.

3. **AFTER CULTURE.**—The culture of Hyacinths falls naturally under three heads:—1, In pots; 2, In glasses. 3, In the open ground.

1. **Hyacinths in Pots.**—It is a matter of no small importance to secure a suitable soil, for although the plant in the first instance feeds on itself, the roots once in action, draw largely from the soil in order to replace the nourishment withdrawn from the bulb. A sandy loam should form the bulk of the soil, but such being usually poor, it must be enriched by a plentiful addition of manure. Cow-dung is the best of manures for the Hyacinth, and it is a good plan to obtain it in a fresh state, mixing it with the loam six months before required for use, turning the whole over two or three times in the interval, that the different substances may be well mixed together. When planting, place the bulb in the middle of the pot, setting it quite upright on a small bed of sand, and so that the apex of the bulb may be half an inch above the level of the soil. Soak the soil with water, and when well drained place the pots, in the first instance, out of doors on the solid ground that worms may not enter. Surround the sides of the pots with cinder ashes, and cover the top with about six inches of the same material. In about two months remove the pots to a cold frame, covering with a mat for five or six days, to avoid a sudden transition from darkness to light. When the mats are withdrawn, give more or less air, according to the season at which the bulbs are wanted to flower, bearing in mind that the more air given the better, provided the frost be completely excluded. The long drooping leaves which we see with some cultivators is due to a too warm or too close atmosphere. So soon as the flower-spike rises, a stiff wire should be passed between the bells the whole length of the spike, the lower end bent outwards till it reaches the circumference of the pot, winding it round the outside of the pot beneath the rim to keep the spike upright and steady. Plenty of water should be given from the time the leaves begin

to grow till the flower shows symptoms of decay, when a gradual diminution should take place. When the leaves turn yellow, water should be entirely withheld, and the bulb should be taken from the pot at the end of July, and stowed away in a dry place for planting in beds the following year. The same bulbs can scarcely be recommended for planting in pots or glasses a second year, but are very good for planting out of doors. Masses of Hyacinths may be planted in ornamental pots or baskets, forming the whole mass of one colour, or the centre and circumference of different colours; and thus ordered, they are at once elegant and effective.

2. *Hyacinths in Glasses.*—Under this form of culture we have in the Hyacinth the most beautiful of house plants in winter and early spring, arriving at the same degree of perfection in town and country. The single kinds, to my eye are always the most beautiful, are especially preferable for glasses, on account of their greater earliness and hardihood. Soundness of bulb at all times important, is more than commonly important here. Set the bulb in the glass so that the lower end, whence the roots are emitted, is almost, but not quite, in contact with the water. Use rain or pond water. Keep the glasses filled up as the water sinks by the feeding of the roots and evaporation. It is a general practice to place Hyacinths in glasses in a dark cupboard or some other place where the light is excluded, and a very good practice it is, for the roots feed more freely in the dark, and thus the system of the plant becomes better stored with food. They may remain in this situation for one or two months, according to the temperature in which they are placed, and should not be too suddenly transferred to the light. Here, as with Hyacinths in pots, when the flowering is over, the bulbs may be brought gradually into a state of rest by the diminution of the supply of water. This done, dry them, store them away, and in due season plant them in beds out of doors to bloom there the following year.

3. *Hyacinths in the open Ground.*—I have never yet seen so much done with the Hyacinth as an out-of-door plant, as I conceive might be done on principles similar to those which have been so admirably carried out in regard to "bedding plants." We have here red, white and blue—to say nothing of the so-called yellow—of innumerable shades. Surely there is ample material for a more extended application of those principles, especially if the aid of the Tulip be called in. The Tulip gives an abundance of yellow, a colour deficient in the Hyacinth. By the combination of these two flowers, a gorgeous and complete flower-garden may be had in spring, as well as in summer, and neither a repetition of the other, but each a change. The Hyacinth is an admirable spring flower. It suffers less from wind and snow, from sleet and hail, than many hardy spring flowers; indeed, almost less

than any other. To-day the snow falls, and the plant is hidden and frozen: to-morrow the sun shines, and it is as erect and as bright as

Hyacinths out of doors should also be planted in the autumn (November). Let the face of the bulb be placed four inches beneath the surface of the soil, and after the soil is pressed add two inches of decomposed manure as a security against severe frost. In February, all fear of severe frost is gone, the manure should be removed. The same soil as that recommended for pot-culture is suitable for Hyacinths out of doors. But it may not be generally convenient to remove and replace soil in the flower glass, Well, this is by no means a *sine qua non* for success. We recommend it, but do not insist on it. The convenience of the cultivator should determine the matter. But if a soil be generally poor, it should be enriched and watered abundantly; if close and heavy, it should be enriched, and will usually be improved by mixing with it a good proportion of clean or river sand.—*Extract from Proceedings of the Royal Horticultural Society.*

[The cut placed at the head of this article represents Mr. Tye's newly invented Hyacinth Glasses, manufactured in England, a quantity of which has just been imported by James Fleming & Co., Seed and Florists of this City. They are an ornamented production.—Eds. C. A.]

The Gladiolus.

It is not the least of the recommendations of the Gladiolus as an ornamental plant, that it proves to be very accommodating to the soil in which it is grown. That it will flourish in sand, and still better if the sand be enriched, is evident from the success which everywhere has been met with by Mr. Sta. Bagshot; but the notion which has been current, that such deep sandy soils are necessary, is by no means confirmed by experience. We are now referring to the Gladioli of former times, the glorious varieties which were great part to the blood of *Gandaceen*, which prove so ornamental when grown in garden, and still more so, if possible, for indoor decoration. These varieties have great constitutional vigour, grow in soils of which Bagshot sand is a type, but flourish admirably in beds made up of top soil which accumulates from the empty flower pots wherever a considerable number and variety of pot plants is cultivated. They ever they grow to perfection in deep loam, provided they are well drained, and the soil rendered friable and open by the addition of decayed manure in a condition suitable

chemical action on the mass. Mr. William has rendered this latter fact evident in his admirably arranged nursery at Waltham, where the soil being a rather heavy loam have seen these Gladioli in a most thriving and whence have been derived the specimens which, though as yet but a limited set of these flowers, Mr. Paul has won a respectable position on the exhibition table, place in the prize lists. No one, therefore, hesitate to plant them from any difficulty to soil.

The question how these Gladioli can be made to lend their beauties in aid of the general effect at our autumnal flower shows, is one which begins to require consideration and attention now that the growers and exhibitors are increasing in number. They do not appear to be quite suitable for pot culture: at present when exhibited in this form they have a rather too lanky, and the plants have not a sufficiently furnished appearance. They are suitable flowers for cutting, and in this form doubtless they will be found best suited for exhibition tables. But then how are they to be shown? Are some exhibitors to show single spikes and others bouquets of each kind, or are they to be required to the exclusion of single spikes? We should say decidedly not, for this would be to give an undue advantage to quantity over quality. Besides, the managers of horticultural exhibitions, besides catering to please the exhibitors, should at least take care that the part of the institution entrusted to their management should tend to improvement in cultivation and how can this be the case, if bouquets of several varieties be permitted to compete for overpower by mere bulk the single spikes of others who are probably more careful and skilful cultivators, but who possess less means or less comprehensive collection. Like a Hyacinth, the beauty of a Gladiolus depends in great measure on its well furnished spike, and the size and perfect form of its leaves; but how can these points be expected when a bunch is shown? Nothing, in fact brought out that way but colour, and the effect made by bunch showing in respect to these qualities referred to is much greater than compensated for by any gain in respect to display of colour. Therefore, we say that single spikes should be shown in competitive

exhibition. How should they be set up? To begin with, they don't look well to our eyes in ordinary boxes, which do well enough for Dahlias, but don't seem to suit the Gladiolus. We infinitely prefer the truss set up in one of Tye's dwarf Hyacinth bottles, and they may be had plain or ornamented, as may be desired; though we imagine those of plain glass would be most appropriate. Then again, a single spike of a Gladiolus, which, be it remembered, looks better of moderate than of ex-

cessive length, provided it is well bloomed, is bare and wanting in relieving foliage. Several attempts have been made to supply this deficiency: the group as a whole has been bordered by various broad-leaved plants to form a background and margin, but broad-leaved plants don't associate well with grassy leaved monocotyledonous like the Gladiolus; they look foreign to it, and seem out of place; a few of its own leaves have been sometimes used, as well as sprigs of some of the larger leaved Grasses such as *Poa aquatica*, *Phragmites communis* and the common striped ribbon grass of the gardens; of the Grasses, the best is the *Poa*, but none of them produce so good an effect, at least in our opinion as the natural foliage of the Gladiolus itself.

The result of our own observation and consideration of this subject then is this:—That for exhibition purposes, Gladioluses should be shown in the form of cut spikes; that the spikes should be of moderate and tolerably proportionate length, but above all well bloomed, not with two-thirds or more of their length undeveloped; that they should be set up singly, one spike of each variety; that they should be placed separately in Tye's Hyacinth glass; and that each spike should be accompanied only by a dressing of three or four natural Gladiolus leaves nearly as long as itself.—*Gardeners' Chronicle*.

Veterinary Department.

(Conducted by A. Smith, V. S.)

How is the Horse to be put in Condition.

Country gentlemen of humane feelings still fondly cling to the old plan of giving their horses an occasional run at grass. It is so natural, they argue, for the poor things to enjoy a few months of unrestricted liberty to graze on their native prairies, and take such exercise as they please. But, besides such poetical and sentimental recommendations, the run at grass is also supposed to "fine down" and strengthen the limbs, and invigorate the constitution. But to the correctness of these conclusions we seriously demur. Such management may answer well enough as a rest for the over-worked draught horse, but is unsuitable for hunters and well-bred hacks. They gorge themselves with bulky food, get gross and fat, and thus overweight their legs; full of spirit and courage, they gallop and play, running imminent risk of sprains and other lameness, and often come up with kicks and blemishes, and even with damaged wind, from undue exertion taken whilst the stomach has been overloaded. They lose, moreover, their hard condition and their ability to go, and proper feeding and well-regulated exercise must be continued for several months to recover the lost muscle and strength of wind and limb.

For mares and foals, for young, unbroken colts of quiet temper, and for draught animals of more placid temperament, a grass field during the summer is all that can be desired. For hunters, hacks, and the lighter sort of horses that have been in good condition, it is, however, an expensive and dangerous treat.

Horsemen are beginning to appreciate the detriment to the health and constitution, and the waste of time and trouble entailed by allowing their horses, as was the old fashion, to get out of condition when not wanted for several weeks or months. They rightly discover that it is more expensive to turn a horse, after the hunting season for example, to grass, thus allowing him to lose his muscle and strength, and again have him in good order for October, than it would have been to keep him all summer in a comfortable roomy box or well-sheltered yard, allowing him a little corn with his hay and green food, and enjoying daily walking, trotting or other suitable gentle work. The desirability of maintaining horses in continuous good condition becomes all the more reasonable when it is considered that condition, though somewhat of an artificial state, is synonymous with the highest health and vigour. What possible advantage can there be in loading the wiry muscled with useless and cumbrous fat, and weighting the frame as if it was intended for Bingley Hall or Baker-Street? The legs do not suffer as is sometimes supposed, by keeping the horse constantly in fair condition. On the contrary, the carcase being light, the limbs are not over-weighted, and like the rest of the body, are also strong, and able to bear their burden. Nothing, we may remark, tends more to shaky, weak, tottering legs than using for fast work horses that are heavy and overloaded with beef, and whose limbs want the toughness and strength which condition alone can give. Although kept during the summer in state fit to go, it is, however, by no means necessary that the animal be subjected to continuous hard work; he need not be galloped or trotted at a "two forty" pace over hard roads. When, like the hunter during the spring and summer months, he is not required for full work, his exercises may be relaxed to an hour or two of walking or gentle trotting exercise, he may be profitably used as a hack, or even for light harness work. A handful of clover or vetches pleasantly vary his diet, and exert besides in a natural way that "cooling" influence on the blood which is so much talked of among stablemen.

Kept in the manner suggested, the horse is at any time in three or four weeks fit for any reasonable moderate work. A little restriction in his hay, a few more oats, his exercise gradually increased, and he will cheerfully and easily perform his allotted work on the road or in harness, whilst with a few preparatory gallops he will not even disgrace his owner if he turns out to the cover side in October. Here the horses

that have run at grass during the summer themselves unpleasantly conspicuous. The spurt covers them with lather, heavily the over a field or two, boring blunderingly at fences, and soon give in dead beat; or if lessly urged along, are apt to sink from exertion or inflammation of the lungs. The muscles of respiration, like those of the limbs and parts, are weak, and incapable of continuing exertion.

To many of our readers it is an impractical question how such an animal can best be rendered serviceable. How can his abilities be most speedily brought to perfection? How can he be prepared so that his duties be performed easily to himself and satisfaction to his master? To condition, as to many things useful and valuable, there is no royal road. The result is to be obtained only by proper feeding, exercise, and grooming. Must be the staple food, and with a horse from grass, or that has been living on food, they should at first be mixed with which will keep the bowels open, and prevent the evil effects which are so apt to follow sudden transition from soft, bulky, lax food to drier and more nutritive fare. From 15 lbs. of oats, according to the size and pettiness of the animal, is a fair daily allowance and should be given cracked or bruised ground, and with a handfull of chaff. Horses intended for fast work beans must be sparingly, as they are apt to cause indigestion and interfere with free respiration. At present among farmers the prevailing dietetic error is an excess of hay. The country lad, who oft as the farmer's groom, is accustomed to farm horses' racks filled to overflowing, acting upon the half true, half false principle that "what is good for the goose is good for the gander;" he thinks the riding horses, unless they have in the rack and under them as much hay as would last them for a week, cannot be too often or strongly insisted upon, and, indeed, all animals, should be exercised regularly, and should never have more than they can clear up at once and with relish. 15 lbs. to 20 lbs. of sound English or clover hay is a liberal allowance for the sorts of horses, of which at present we are hearing. We would never have a horse restricted in his allowance of water, except for seven days before he is required for work; and to his taking at a time more than is good for him he should be offered it at frequent intervals of not less than 5 or 6 times a day. If horses are kept, as they should be, in loose boxes or commodious yards, regular exercise during the summer months, and not in work, is not essential. But all horses, if used or intended to be used within three months for hunting or other such work, must be exercised, which ought to be gradually increased in severity and duration until the horse

of performing easily the work required of it. To the discretion of the groom or his master must be left the various questions as to the length of time the horse is to be out, the nature of the exercise, whether he is to go out in coats, &c. But however these matters be settled, the horse on coming in must be well groomed, rubbed dry, and made comfortable. The clipping or singeing is practised a rug is not desirable; but the loads of clothes often used are needless and injurious, only securing a sleek, dry skin with less labor to the groom, but at the sacrifice of the poor animal's comfort and health, and with the certainty of rendering him more susceptible of cold. The same, or still more serious, objections attach to the common practice of keeping the stable too warm. For 27 horses recently taken up from the fields and the temperature should not exceed 50, and from 55 to 60 degrees will be sufficiently warm for any horses.—*North British Agriculturalist.*

Miscellaneous.

ANOTHER BALLOON ASCENT.—THE BRITISH AERONAUTICAL ASSOCIATION.—On Monday, Mr. Glaisher, the principal agent of the meteorological department at the Royal Observatory, made a second ascent from the works of the gas company, in Wolverhampton. As on the first occasion, so on the second, the ascent was made in Mr. Coxwell's hydrogen balloon, and under the direction of Mr. Glaisher as pilot. The instruments taken up were the same as on the first occasion, and similar to those used on the previous ascent, the only exception being that of Thompson's electrometer, which was destroyed in the descent upon the first occasion. That instrument being absent, the observations will be confined to the primary observations contemplated by the association—namely, the humidity and temperature of the atmosphere, with its pressure, and the vibration of the air, and how much (if any) ozone there is in the atmosphere away from the earth. About 1000 cubic feet of very light gas was turned out shortly before one o'clock, Mr. Glaisher having shipped all his instruments and arranged them on the board before him, preparations being made to leave the earth. One-fourth of the quantity of gas supplied was let out, with a bag of ballast, and the signal having been given, the balloon left the earth at two minutes past one, amidst the warmest plaudits from Lord Altesley and a large number of the gentry of the neighbourhood. The ascent was a most successful one, the wind was moving about 20 miles an hour in the lower region of the atmosphere, the sky was clear, and the sun was shining brightly. The direction in which the balloon was wafted was south by west, about half a mile to the west. On attaining to about 10,000

feet the upper current of the atmosphere was met with; the voyagers then got into a southerly direction; were seen due south, then a point or two to the east; and in about a quarter of an hour after they left the earth's surface they were north by east, about half a point to the east. They then seemed to take their first dip from a high to a lower altitude, and then again to ascend; and it was thought a second dip was made during the time that they were in sight, which was nearly two and a half hours, for so clear was the atmosphere, so immense the size of the balloon, and so slow the motion of the wind, that it was 3 25 p. m. before the machine was lost to the sight of the spectators on the ground whence it ascended. The direction taken seemed to be over Birmingham, and towards Coventry. Great interest is felt in the experiments now being made, the results of the previous experiments being, in many respects, contrary to all views hitherto entertained on the points of meteorology that are now being investigated. For instance, a cloud one mile thick was passed through on the first occasion, without there being any dew deposited on the most sensitive hygrometer, and no ozone was found in the air, notwithstanding that, in experiments on the earth, the most ozone was found at the high altitudes. For the experiments of Monday, ozone papers were specially made by Dr. Moffat himself. The balloon descended at five minutes past four o'clock, at Solihull, 25 miles from Wolverhampton, after attaining a height of four and a half miles, where the temperature was 24 degrees, the barometer about 13 inches, and the dew point minus ten.

A SKYLARK PREACHING A SERMON.—There is no such thing as a song-bird in Australia; there are birds who chatter, birds who shriek, but no birds that sing. Well there was a young man who went from England as a gold-digger, and was lucky enough to make some money, and prudence enough to keep it. He opened a "store"—a kind of rough shop where everything from candles to coffees are sold—at a place called "The Ovens," a celebrated gold-field, about 200 miles from Melbourne. Still continuing to prosper, he, like a dutiful son, wrote to his father and mother to come out to him, and if they possibly could, to bring with them a lark. So a lark was procured, and in due time the old folks and their feathered charge took ship and departed from England. The old man, however, took the voyage so much to heart that he died; but the old woman and the lark landed in sound health at Melbourne and was speedily forwarded to Mr. Winstead's store at the Ovens. It was on Tuesday when they arrived and on the next morning the lark was hung outside the tent, and at once commenced piping up. The effect was electric. Sturdy diggers—big men, with hairy faces and

big brown hands—paused in the midst of their work, and listened reverently.—Drunken, brutal diggers left unfinished the sentence and looked bewildered and ashamed. Far and near the news spread like lightning—"Have you heard the lark?" "Is it true, mate, that there is a real English lark up at Jack Wistlead's?" So it went on for three days, and then came Sunday morning. Such a sight had not been seen since the first spadeful of golden earth had been turned! From every quarter—east, west, north, and south—from far hills and from creeks twenty miles away, came a steady concourse of great rough Englishmen, all brushed and washed as decent as possible. The movement was by no means preconceived, as was evident from the half-shamed expression of every man's face. There they were, however, and their errand was to hear the lark! Nor were they disappointed. There, perched in his wooden and iron pulpit, was the little minister; and as though aware of the importance of the task before him, he plumed his crest and lifting up his voice sang them a sermon.

It was a wonderful sight to see, those three or four hundred men; some kneeling on the ground; some sitting with their arms on their knees, and their heads on their hands; some leaning against the trees with their eyes closed, so that they might the better fancy themselves at home and in the midst of English corn-fields once more; but sitting, standing and lying, all were equally quiet and attentive; and when, after an hour's preaching the lark left off, his audience slowly started, a little low-spirited, perhaps, but on the whole much happier than when they came.—*Boston's Home Pets.*

Hints for October.

October is one of the most active months in the year with the gardener, orchardist, and nurseryman. A multitude of labours demand simultaneous attention, and it requires the most untiring energy and industry on the part of every one who has any considerable charge on his hands to see that every thing is done at the proper time and in the proper manner. Fortunately, in this country, our October weather is delightful—dry, cool and bright, generally, and therefore eminently favorable for the rapid and proper execution of all out door work.

Transplanting of all hardy trees, shrubs, and plants usually begins here in the north about the 1st of October; farther south it must be deferred later. It is by no means necessary to wait until the leaves have fallen. If growth has fairly ceased, and the wood has become firm, trees may be removed; the leaves must be taken off to prevent shrivelling, and the roots must be carefully guarded against exposure until they are again placed in the ground. Autumn planted trees should by all means be secure against the

winds, either by staking or banking up, and they should be well mulched besides.

Neglected orchards should be renovated manuring and ploughing or spading about roots. This should never be deferred till spring because during the winter and spring the sod decays and the manure dissolves, and abundant food is thus prepared the trees next season.

Kitchen and garden crops for winter spring use require nice management to keep them in a proper condition. Such as are taken up and placed in the root-cellar should be harvested when dry, and the cellar should be clean, sweet, and perfectly free from moisture both above, and below; it should also be kept cool possible, but not admit frost.

Such of the bedding plants as it is desired save for another season, should be carefully lifted early, and either potted or planted close in boxes, and placed where they will have light and not freeze. Many of the bedding plants taken up carefully and in good season, may materially to the beauty of the greenhouse through November! Many of the late flower annuals are useful in this way.

Hardy bulbous roots should be planted immediately, yet it can be done any time before ground freezes. There are certain things to vegetate early in spring, and should therefore always be planted in the fall, such as gooseberries, currants, rhubarb, and all hardy spring flowering shrubs and herbaceous plants. Good bloom next spring may be secured by planting now, but will be lost if the planting be deferred till next spring.—*P. Barry.*

ANIMAL INSTINCT.—I knew of a jackdaw often used to eat the gum that exuded from plum trees, and always did so when it was well. In connection with this subject, it may as well be mentioned that a careful observer would find himself repaid by watching the modes of cure employed by sick or wounded creatures. We all know that the dog will resort to grass when they feel out of health, hares to a species of moss. I was also on the authority of the eye-witness, that a finch, which had been struck by a hawk wounded, made its way to a dry puff-ball, it open with its beak, and dusted the wound on the shoulder with the spores, thereby stopping the effusion of blood. The spectator was greatly surprised at this incident, and being indolent to try the effects of the same remedy upon a wounded finger, found that the experiment was completely successful.—*Routledge's Illustrated Natural History.*

CHLORIDE OF LIME AS AN INSECTICIDE.—Scattering chloride of lime on a plank in which all kinds of flies, but more especially gnats, were quickly got rid of. Sprinkling of vegetables with even a weak solution of salt effectually preserves them from the attacks of slugs, caterpillars, butterflies, moths,

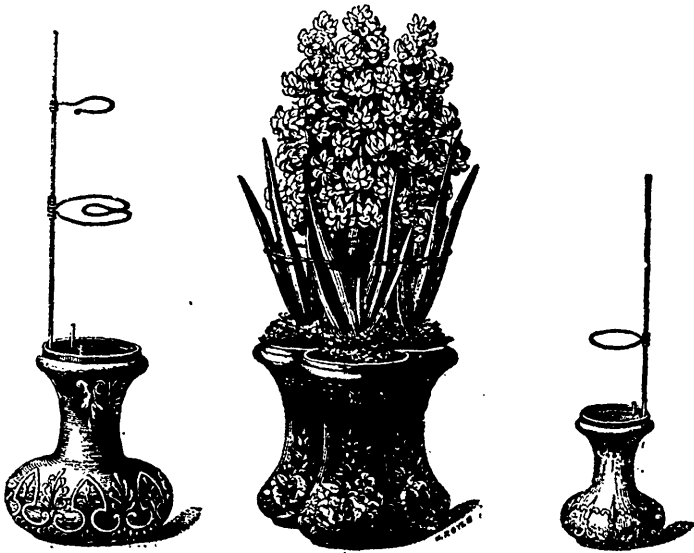
It has the same effect when sprinkled on the foliage of fruit trees. A paste of one part of chloride and one-half part of lard, placed in a narrow band round the trunk of a tree, prevents insects from creeping up it. It has been noticed that rats and mice quit places in which a certain quantity of chloride has been spread.

Editorial Notices, &c.

Agricultural and Veterinary Instruction.

Arrangements are being made for opening a class of young men for the study of the Veterinary art and the principles of agriculture, in Toronto, under the auspices of the Board of Agriculture, to commence about the middle of January, and to continue for five or six weeks.

Mr. Smith, a licenciate of the Veterinary College of Edinburgh, and Veterinary Surgeon to the Board of Agriculture of Upper Canada, will give instruction in the anatomy, physiology and diseases of the Horse, and farm animals generally, and Professor Buckland, assisted by the Professors of Chemistry, Geology, and Natural History in University College, will take the various branches of science that relate to the practice and theory of agriculture. It is hoped that a considerable number of young farmers from different sections of the country will avail themselves of such an opportunity of improving themselves in a knowledge of the principles of their important art. Full particulars hereafter.



DUTCH FLOWER ROOTS.

THE SUBSCRIBERS BEG TO ANNOUNCE that they have just received their annual importation of Bulbs in good condition—consisting of *Double and Single Hyacinths*, \$1.00, \$2.00, and \$3 00 per dozen. A fine assortment of *Tulips*, from 50 cents to \$2.00 per dozen. *Crocus*, 12 to 20 cents per dozen, and at \$1.00 and \$1.50 per 100. *Polyanthus*, *Narcissus*, 12 to

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Descriptive Catalogues furnished gratis on application. They would also call attention to their fine stock of English Hyacinth Bottles, with supports, suitable for growing Hyacinths in winter, and for holding parlour bouquets in summer. (See above cut.)

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Toronto, Oct. 27th, 1862.

tf.

Horse Infirmary and Veterinary Establishment
Corner of Bay and Temperance
Streets Toronto, C. W.

A SMITH, Licentiate of the Edinburgh Veterinary College, and Veterinary Surgeon to the Board of Agriculture of U. C., begs to return his thanks to the Public generally for their support since opening the above mentioned establishment, and respectfully solicits a continuance of the same.

And also begs to announce that Veterinary Medicines of every description are constantly kept on hand:—Such as, Physic, Diuretic, Cough Cordial, Tonic Condition, and Worm Balls and Powders. The constituents composing the Cough-balls, have been found (by Professor Dick, of Edinburgh) most serviceable in alleviating many of the symptoms of Broken-wind or Heaves in Horses. Colic Draughts, &c., a mixture which owners of Horses should always have beside them.

Liniments for Sore throat, Sprain, Curb, Spavin, Ringbone.

Blistering Ointments. Liquid and sweating Blisters.

Horses bought and sold on commission.

Toronto, Aug. 30th, 1862.

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P. R. WRIGHT, Cobourg, C. W.

Aug. 30th, 1862.

6-mos.

Contents of this Number.

Hints for November.....
The Wire Worm.....	.....
Short-Horns as Show Stock.....	.....
Experiment with Sheep.....	.....
Farm Capital.....	.....
The Agriculture of Sweden.....	.....
Town Sewage.....	.....
The Value of Food.....	.....
South Australian Farming.....	.....
Agriculture of Colorado Territory.....	.....
Weedy Neighbors.....	.....
Use of Leaves.....	.....
Temperature of the Earth under Sod and under Cultivated surface.....	.....
Selection of seeds of the Cereals.....	.....

AGRICULTURAL INTELLIGENCE :

Michigan State Fair.....	.....
Kerry Cattle.....	.....
Sale of Mr. Sanday's Leicester Sheep....	.....
Lord Polwarth's Flock, Sales of Shrop- shire Sheep, Autumn Show and Sale of Tups at Kelso.....	.....

HORTICULTURAL :

Light in Plants.....	.....
The Hyacinth.....	.....
The Gladiolus.....	.....

VETERINARY DEPARTMENT :

How is the Horse to be put in Condition?
--	-------

MISCELLANEOUS:

A Balloon Ascent. A Sky-lark. The Colour of the Sea, &c.....
---	-------

EDITORIAL NOTICES :

Agricultural and Veterinary Instruction &c., &c.....
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