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THE

Canadian Agriculturist.

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MANURES.

INCRUSTATION OF SEEDS.

A new idea, or an old idea newly applied in regard to plant-food, or manure, is just now attracting attention in France and England. We have read the discussions and suggestions on the subject with much interest, and we believe the intelligent, enquiring readers of the *Agriculturist*, will agree with us, after perusing the following summary of the new plan and the reasonings in support of it, that it is a matter well worthy of consideration and experimental test by the practical as well as the scientific farmer. Concentrated manures are but little used in this country as yet, but every year they are becoming more important. Formerly, when science was still in its infancy, experience to a certain extent, but routine especially, were the only guides of agriculturists in their modes of preparing the ground for the reception of the seed. Farm-yard manures and bare fallows were the only means of restoring the spent energies of the soil ; and these were then, and are even now to a great extent, indiscriminately resorted to, without any regard to the chemical constitution of the soil, or the requirements of the plants that are to grow upon it. This remark applies to the best cultivated portions of Europe, as well as nearly the whole of America. Analytic science, and the wonderful discoveries of vegetable physiology, have of late years thrown a great deal of light upon the subject of manure, its mode of application to the soil,and its assimilation by the plants. And yet, practically, little progress has been made. We see a great many kinds of artificial manures daily advertised in the agricultural papers of Great Britain and the United States, but, after all, the progress accomplished is by no means adequate to the strides which science has made in the analytic knowledge of manures, in the exact appreciation of their fertilizing qualities and their action upon vegetation in various plants. We still cart away to our fields the same ponderous loads of farm-yard dung, a large per centage of which is of no earthly use, and can only be regarded

as the huge vehicle of a very minute proportion of ammonia and alkaline salts. Even guano and superphosphate of lime are encumbered with a large proportion of useless ingredients, all of which are costly to purchase and cumbersome, and therefore expensive to carry. Besides, what a large proportion of the manure which we lay over our fields is utterly lost to the crop we want to grow! What a large per centage is eaten up by noxious weeds, or disseminated through a part of the soil untouched by the roots, and therefore immediately useless! On the other hand, we know, from clear demonstration, what the substances are which each crop draws from the soil; we know to a fraction the quantity of each of those substances respectively; and when we come to compare their aggregate weight per acre, with the quantity of manure which we have laid over that extent of ground, we are astounded at the difference in bulk and weight. If a plant is dried and burnt, the little pinch of ashes that remains, after complete combustion, represents the amount of mineral substances which the plant has drawn from the soil. The rest, which has evaporated in the air by the process of combustion, represents those constituent parts which the plant has derived from the air. Chemistry tells us exactly what substances the ashes contain, and in what proportionate quantities. It is then obvious that either the soil or the manures put on it, or, as is most generally the case, both combined, have supplied those substances to the plant, without which it could not have arrived at maturity. But here we may well pause, and ask ourselves whether, in order to administer to the plant so small a quantity of food—another and a more simple mode cannot be found; for that quantity, though it be multiplied by the number of plants in an acre of ground, still remains comparatively minute when we compare it with the bulk and weight of the 20 or 25 cubic yards of dung we have laid over it. Again, if we calculate the cost of that manure and the value of the labour which its use has necessitated, we find that the little heap of ashes which has been the result, has cost us an immense sum of money; in fact, a much higher sum than the pure chemicals of which it consists, could be bought for in the trade.

These considerations have of late years induced both scientific men and practical agriculturalists to turn their attention to concentrated manures, that is, diminishing the bulk of useless substances, serving merely as vehicles to the really fertilizing element, in order to render them more portable, and more energetic, proportionately with their bulk. Abstractedly, this is evidently the goal of our progressive ideas in agriculture; that is, the simplification of all means, either in labour or manures—the one by concentration of fertilizing energies; the other by means of ingenious machinery, and especially the use of steam power in field as well as barn operations. It is true to a certain extent that, apart from the primary purpose of restoring the exhausted fertility of the soil, stable and other bulky manures have other advantages, mechanical and thermal; for instance, in dividing a stiff soil, and imparting to it a higher temperature by decomposition from fermentation. But, with thorough drainage, these advantages have become less important.

The bulk of cultivated lands of this country, and indeed of America generally, do not require this mechanical action of stable manure. The question then arises, How can we best turn these scientific discoveries to practical account? How can we concentrate manures, and having succeeded in this, how can we apply them? This brings us to the "new idea" we have referred to, and we shall allow one of the French writers on the subject to state the theory in his own words:—

"Boussingault, in his recent experiments in the production of what he calls a *limit* plant has proved that the seeds of many plants contain the necessary quantity of nitrogen, not only for the germination of the plant and the nutrition of the nascent stem and leaves before the radicles have been sufficiently developed to draw a supply from the soil, but also to the production of a perfectly organized plant, though exceedingly reduced in its dimensions. In fact, such a plant—after several months' existence in the open air, or even in a confined atmosphere—has been found to weigh but very little more than the seed from which it sprang. This clearly shows that the extent of the organism of that plant was limited by the quantity of the nitrogenous principles contained in the seed; but as soon as he applied to the soil (exclusively composed of calcined quartz sand, not containing a particle of decomposed matter or mineral manure) a small quantity of phosphate of lime, nitrate of potash, and vegetable ashes rich in silicate of potash, the plant immediately sprang up from its torpor and grew luxuriant and strong, bloomed and brought forth matured seed as well and as rapidly as another plant of the same kind had done upon a garden-strip richly manured.

"This experiment clearly shows that the soil upon which the plant grew exercised no immediate influence whatever upon the growth of the plant, so far as its nutrition went, but merely as a vehicle for heat and moisture, as well as the holder of the plant and of the pure mineral salts upon which it lived and developed itself. This naturally leads us to ask the question, whether, instead of incurring great expense and trouble in manuring the soil thoroughly with heaps of dung containing but a small percentage of fertilizing matter, which is still reduced and less available to the plant by being disseminated over a larger surface than the roots of the plant can possibly compass, it be not possible to manure the seed itself, that is, surround it by a crust formed of the very mineral substances which are necessary to its growth, in the same proportion as they are found to exist in the seed, and in a sufficient quantity to represent exactly the weight of the aggregate mineral substances which are abstracted from the soil by the well-matured normal plant? This crust could then be considered as the mere extension of the seed to a larger bulk; and as the seed contains what is necessary to feed germination, and even to form a complete plant, though limited in weight to the extent of food contained in the seed, so the seed being increased to any required number of times its size and weight by the agglomeration of substances, such as phosphates, nitrates, and silicates, would be enabled to supply to the growing plant the necessary elements of normal growth and perfect maturity.

"This is indeed no new theory, and many have been the attempts even in times of remote antiquity to realize it in a practical manner. Many are the inventors of wonderful liquids, in which the seeds were to be steeped, and thereby imbibe all the required elements of nutrition and fertility. All these have failed, not because the principle was not a sound one, but because it was not properly applied. For it is obvious that a liquid manure, however rich in fertilizing elements, could not fix these round the seed in a sufficient quantity so as to increase its store of nutritive matters—this can only be done in a solid form. Then, until very recently there was also the insuperable difficulty arising from ignorance, science not having yet shed the light of its discoveries on the mysteries of vegetation; and the wonderful action of phosphates, nitrates, and silicates upon vegetation, although practically known, had not been determined with sufficient minuteness and accuracy to lead to anything like an authentic formula of proportion and quantity. But failures, however complete they may be, in carrying out great ideas, are no argument against a renewal of efforts; and when those failures, as in the case of steam-engines, railways, reaping-machines, or the application of steam to the cultivation of the soil, are found to act rather as incentives to the ingenuity of men, instead of damping their energy and the buoyancy of their hopes, we know it from the experience of the last thirty years that it is a sure sign that the idea is good, and will be ultimately carried out.

"But there are objections to this system. What system is free from objections? Some say

that the mineral matter with which the seed is enveloped, on being disolved in the soil, will settle immediately around the neck of the roots, which will naturally dive away from it, and it will then become useless to the progress of the plant after it has attained a certain development. I believe that this objection is more specious than real; for every one must have observed that when a seed has fallen upon a manure heap, and there germinated to a plant, if that plant be pulled up, it is found that the roots are very short and shaggy, and do not seem to have penetrated beyond a very limited area, the number of rootlets making up for the deficiency of their length. This seems to me easily accounted for; because the roots, finding in their immediate vicinity a sufficient supply of nutritive elements, have no inducement to dive at any great length in search of them."

"However plausible this and other objections may be, the best test, after all, is the test of experience; and that system, which I have called, for want of a better word, the incrustation of seeds, must live or die by that great test. A French gentleman has recently come to this country, to submit his invention of a machine for preparing the seed, and the formulas regulating the nature, proportions, and quantities of the mineral substances to be used, to the verdict of English practical farmers; and I am in a position to state that his appeal has been favourably received, and experiments are being made in various parts of England with the view of testing the value of that gentleman's discoveries. Messrs. Burgess and Key have been entrusted with the construction of the simple machine for the encrustation of the seed This machine consists in a hollow cylinder, suspended by two leather straps from a pully, to which a rotary motion of about forty revolutions in a minute is imparted, either from a steam-engine or any other motive power. In the cylinder the seed is introduced mixed with an agglutinous mixture, itself rich in nitrogen; and then the mineral substances, reduced to a fine powder are added, and from the rotary motion of the cylinder adhere to the seed in a regular coating; this is repeated until the entire quantity has been fixed. In order to prevent the humidity of the agglutinous mixture from acting upon the seed, and causing it to germinate before it is put into the soil, an hygrometric substance is mixed with the mineral powders, which abstracts all the excess of humidity from the glue, and besides dries up the crusted seeds almost immediately.

"Previous to his coming to this country, Mons. D'Illiers has satisfied himself by numerous experiments of the value of his discovery; and at the late sowing season, a large area has been sown with his prepared seed in various parts of France, so that at the time of next harvest I shall be enabled to give an authentic account of experiments tried both in France and in England, under every variety of local circumstances of soil, climate, and modes of husbandry."

Why should not experiments on subjects of this kind be undertaken in this country also? Could not the Board of Agriculture devote a portion of their time and funds, with great advantage to the farmers of Canada, to the testing of manures, and the best modes of applying them? The subject is one of immense importance, and *must* soon engage the attention of every man interested in maintaining the fertility of the soil.

EVILS OF OVER-FATTENING STOCK.

For many years grave objections have been repeatedly urged against the practice of the excessively artificial system of feeding cattle, sheep, and pigs, for the exhibition of fat stock, especially the Smithfield Christmas Show in London. An elaborate and scientific report on rigid examinations of certain animals which took premiums at the last Smithfield Exhibition, has just been published, and which cannot fail to awaken general attention to this subject. The report is the production of Mr Gant, assistant-surgeon to the Royal Free Hospital, whose knowledge of general and comparative anatomy, and well-known familiarity with the use of the microscope, entitle his state-

ments to respect. His microscopical observations are confirmed by the celebrated Professor Queckett, curator of the Royal College of Surgeons.

After describing the living appearance of certain prize animals at the Show, such as cattle, sheep, and pigs, some of them owned by the Prince Consort and the Duke of Richmond, all monstrously fat, and exhibiting great difficulty in breathing, Mr. Gant observes:—"Throughout the exhibition one circumstance particularly arrested my attention. It was the size of the animals compared with their respective ages. The bullocks averaged from two to three years; the pigs and sheep were about one year old. When I contrasted the enormous bulk of each animal with the short period in which so much fat or flesh had been produced, I certainly indulged in a physiological reflection on the high pressure work against time which certain internal organs, as the stomach, liver, heart, and lungs must have undergone at such a very early age. I therefore resolved to follow up those animals to their several destinations, and to inspect their condition after death." Mr. Gant was admitted to the slaughter houses when the gold and silver prize bullocks, heifers, pigs and sheep, that remained in London, were killed, and after carefully removing the heart, lungs, liver, &c., he made dissections of these organs, and provided faithful drawings of both their visible and microscopical appearances. Our space will only admit of a slight reference to their symptoms.

In the sheep, the hearts of several specimens were found in an unnatural, that is, unsound condition; the external surfaces very soft, greasy, and of a dirty brownish yellow colour, motted with yellow spots of fat imbedded in the substance of the heart. Under the microscope the process was readily detected of the muscles being changed into, or overlaid by fat. The lungs were flabby, with numerous tubercles, and their function, or power of action, greatly diminished. Similar observations apply to the pigs, whose circulating system suffered serious interruption, indicated by the dark, livid liver. In horned cattle, the left ventricle of the heart had, in the several instances examined, been more or less converted into fat, having a yellow, soft, and greasy appearance. The intestines also exhibited a fat, putty-like mass, from an inch to an inch and a-half thick, in various parts of their surfaces. The worst feature of high breeding, early maturity, and consequent aptitude to fatten, appears to be under our modern stimulating system to convert the most important organ of life and health into a mass of fat. The stomach may indeed prepare food for the production of blood, and the lungs and kidneys may purify it of excrementitious matter, but these departments of the blood-factory are only subsidiary to the heart,, whose special duty it is to propel the vital fluid to the most distant recesses of the body, that every part may be nourished and renovated. Yet I found the great central organ more than any other damaged. * * * This material (fat) may itself be regarded as the superfluous food with which the animal had been gorged. It was first deposited in all loose parts of the body, these being most adapted for its accumulation, beneath the skin, and around the kidneys, stomach, intestines and

heart. At length, in such localities, the fat invaded the muscles themselves, by passing in between the fibres. Thus is produced the streaked appearance of meat,—a condition which, within due limits, in no way interferes with the health of the animal, nor impairs the nutritive quality of its flesh for food. On the contrary, fat itself is a necessary constituent of the most nutritious food; and by no provision can a due proportion of this ingredient be secured so effectually as when it is thus intermixed with the substance of the muscles themselves. Thus each mouthful of meat contains a wholesome and agreeable proportion of fat; but beyond these limits an animal cannot be fattened without impairing its own health, and also its nutritive value as human food. Let an animal be fed beyond the limits compatible with health, and the superfluous fat is no longer confined to the interstices of muscular fibres, but actually invades, and eventually supersedes them."

It may be said that there is but little danger of over-fattening live stock in Canada, as our animals, generally, are not distinguished for too high breeding, nor are they crammed and pampered with oily and stimulating food. We have seen, however, particularly at our butchers' Christmas show of meat in Toronto, both cattle, sheep, and swine, fattened to a degree that can scarcely be considered compatible with the health of the animals, or the wholesomeness of their meat for human food. Both sheep and cattle, although in low condition in spring, will often upon our pastures in summer and autumn, lay on fat rapidly, sufficiently so for all useful and practical purposes, without recourse to artificial stimulants.

The Report thus concludes :—"Under the present system the public have no guarantee, and are not insured the best, if indeed the cheapest food. The bulky withers of a fat bullock are no criterion of health for his flat, tubular back may conceal the revolting ravages of disease. All this alone can be discovered by an inspection of the animal's interior after death. The flesh of animals which has been produced by organs themselves diseased, is itself also necessarily deteriorated, and ought not to be regarded as prime samples of human food. These facts will be best understood by pathologists, but they also come home to the understanding, and certainly to the stomachs of the people."

A Miraculous Corn.—The Michigan "Farmer" says: There are new circulars being issued which proclaim the Wyandotte Prolific Corn, the wonder of the age. Its yield is terrific 20 stalks from a single grain, and 128 bushels of shelled corn a common product. This is all certified to by responsible parties, and of course we have to believe it. It must be so, or it would not be put in print! especially by those who have the corn for sale at the rate of $4 00 enough to plant an acre. Wyandotte corn is a new variety of white corn, said to have come originally from California, where it was cultivated by a tribe of Indians of that name. It stools out more than any other variety, and if the accounts are correct, it yields remarkably. Mr. Wm. Cochrane of Corunna, Shiawaesse county, the agent of Messrs. Penfield, Burrall & Co,, nurserymen, Lockport, N. Y, called upon us on the 25th. and showed us an ear of this corn, which he had bought at Evansville, Indiana. It was one of fourteen which had grown from a single grain. The ear was handsome in shape, about 11 inches long, and the grains of corn were large, white, flat, compact and regular. The question is, will this corn ripen as far North as this. It did not ripen in New York this past season, but it was an unusually wet, cold fall, and spring. The Wyandotte corn certainly is worth trying, but don't depend upon it for a crop.

DR. VOELCKER ON THE COMPARATIVE VALUE OF ARTIFICIAL AND FARM-YARD MANURES.

Professor Voelcker recently delivered a lecture on the above subject, in the Lion Rooms, Shrewsbury.

The CHAIRMAN said the subject upon which they were about to hear a very interesting lecture was a very important one to the farmer.

Dr. VOELCKER said there had been a good deal of talk about the relative merits of farm yard manure and artificials. Some would have nothing but the former, while others evidently thought the perfection of good farming was to use an unlimited quantity of artificial manure. Many of the latter gentlemen troubled themselves very little about what they really bought; it sufficed for them to expend a certain amount of money on some description of artificial manure, which might be entirely valueless for their particular purpose. Such, for instance, as the London Economic, the essence of Guano, and others. Now, farm-yard manure was an excellent thing in its proper place, and so was any other description of manure. Some artificial manures, which were exceedingly valuable, lost their efficacy from being improperly applied, and a great quantity of valuable manure at the present day was wasted on farms for the want of knowledge necessary for its application. Those who had not sufficient intelligence or general knowledge on the subject of plants would be less likely to go wrong if they followed the old-fashioned routine and used farm-yard manure, than by using artificial manure, which at least would be of no use to them. Some knowledge ought to be had of the wants of the different crops that grow in rotation. Those wants could not well be laid before his hearers without a reference to the character or properties of the soil to which they were applied. On the whole, the proper system of manuring required a great deal of rudimentary knowledge, which could not be treated of in a single lecture. He would, therefore, rather offer a few remarks on the comparative advantages of natural and artificial manure; and each of these possessed peculiarities of their own, which rendered them perfectly well adapted to special purposes. As would be seen on reference to the diagrams, one peculiarity of farm-yard manure was its extreme complexity of character. [The diagram referred to, contained the analysis of the component parts of fresh and rotten manure.] It contained both organic and inorganic food, and was applicable to a variety of crops, such as corn, root crops, and grass land; and this, no doubt, was the reason why farm-yard manure was entitled to the name of universal manure. It contained everything required by our cultivated crops. But he did not say that it should always be used indiscriminately. Another peculiarity of farm-yard manure was that it exercised beneficial effect on plants, not only supplying direct food to them, but producing a highly beneficial mechanical effect on the soil, especially on stiff clay land. He was a strong advocate for long dung being applied as soon as possible. In the yard manure one great peculiarity was the large amount of water—in fact, this amounted generally to 66 per cent, and in rotten it amounted to three fourths of the whole bulk; so that for every ton of active manuring matter, the farmer has to cart three tons of useless materials, even supposing that the remaining ton is composed of nothing else but valuable fertilizing constituents. This would explain why it was that artificial manures were especially adapted for hilly districts, and for fields removed a considerable distance from the farm-yard. He did not think that farmers always took a sufficient account of the wear and tear of horses and men in the transit and application of that manure. If the subject were carefully considered, the farmer would think twice before he carted a heavy load of farm-yard manure some eight or nine miles from a town, and afterwards applied it to a remote field on the farm; and he would also hesitate before producing farm-yard manure at any expense. Under some circumstances, which every farmer ought to know best for himself, feeding cattle did not pay at all; farmers sometimes made up their minds to feed at a loss, calculating on something for the manure. But it was a very delicate question whether this was the best way of producing manure, or whether it was not better to use the ordinarily-made manure, and apply it in connection with artificial or special manure, the latter term showing that it was adapted for special purposes. If a farm was not in good order, it ought to be brought round by general manure, such as farm-yard manure; but when it was in better condition, to make it go as far as possible, special manures must be resorted to. A peculiarity in artificial manures was that they supplied special fertilizing ingredients, to the exclusion of some others which were abundant in farm-yard manure. For instance: In the best Peruvian guano, there was a high per centage of ammonia, with about 20 or 25 per cent of phosphate of lime; and that guano was applied for getting an additional crop of corn. Some other artificial manure—bone dust, for instance—were valuable on account of their containing phosphate of lime, which was

favourable to the production of roots, nothing tending to the rapid development of bulb so much as that. He did not mean that phosphates were of no use to corn crops. In some soils they produced a marked effect, and he had that morning recommended a gentleman to use superphosphate by way of a trial, to keep up his wheat. There had been a good deal of talk about a deficiency of silica in soils, which prevented corn from standing up. It was remarkable that soils peculiarly liable to corn lying down, generally contained a high per centage of silica. From observations that had been made on the subject, he was inclined to think that what had been said about silica must be regarded more as a theory rather than a resting on well-ascertained facts. It had not yet been ascertained how it was that some crops were stronger than others; and until that was found out, it was of no use reasoning upon the matter. Corn became laid down from a variety of reasons. If the land contained a supply of all the elements necessary for the growth of the plant, a dressing of guano produced a course wheat, which often became laid down. When wheat became laid down, it arose from something in the soil being in too large proportion. Some people had a curious way of estimating the skill of the farmer by the amount of the manure which he put on his land. Some men were content with eight tons of farm-yard manure, while others used as much as twenty tons to the acre. The farmer, however, who tried the larger dose, did not often repeat the experiment, for he became convinced that, in farming, what was good in one instance was not good in another. The great advantage of artificial manures was that they contained special fertilizing ingredients to the exclusion of other substances, and hence its adaptation to special circumstances. How were these special circumstances to be ascertained? He had no doubt in his own mind that bone dust or superphosphate, mixed with farm-yard manure, would be of great advantage, as it would supply the element which was very much deficient in farm-yard manure, especially where the manure was produced by young and lean stock, which absorbed all the phosphate of the food; in the manure from fattening animals, there was a large proportion of this substance, and hence its great value. Pho-phates, generally speaking, were more suitable for root crops, but it was impossible to lay down general rules; the farmer himself ought to be the best judge, whether in order to obtain a good crop anything else was required. Turnips did not live alone upon phosphate; they required a variety of other substances—lime, soda, potash, and other fertilizing matters. It depended upon the farmer to find this out, and no one else. There was a good deal of land in this part of the country which required nothing more, in order to obtain good root crops, than bone in an efficient state of preparation. The learned professor then went on to observe upon the constituent parts of guano and superphosphates and their application to particular soils and for particular crops. [The substance of this part of his lecture will be found in our report of the Wenlock Farmers Club.] He illustrated the immense importance of examining the manure we buy, by referring to the following table, which proved that some superphosphate contained four times as much valuable fertilizing matters as others :—

COMPOSITION OF SUPERPHOSPHATE OF LIME.

	I.	II.	III.	IV.	V.	VI.	VII.	VIII.
Water	19.26	20.53	14.40	22.03	20.37	8.91	10.80	26.89
Organic matter	16.10	14.76	8.93	trace.	25.71	..	4.21	2.08
Soluble phosphate of lime.	6.38	10.31	3.60	8.55	5.05	25.70	20.28	14.78
Equal to bone earth	(9.94)	(16.09)	(5.61	(16.33)	(7.37)	(40.11)	(31.63)	(23 06)
Insoluble bone phosphate	22.16	17.72	6.83	..	1.56	6.68	4.11	5.58
Hydrated sulphate of lime (gypsum)	25.10	28.39	44.20	24.42	40.16	43.05	46.63	43.60
Burnt gypsum	..	..	..	40.43	..	12.38	..	..
Alkaline salts	5.16	1 56	2.52	2.41	2.93	.96	10.78	1.18
Sand	5.82	6.73	19.50	2.16	4.23	2.32	3 19	5.26
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Per centage of nitrogen	1.66	8.53	1.44	.17	1.11	..	.34	.21
Equal to ammonia	2.01	1.065	1.75	.20	1.42	..	.41	.25

Mr. GEORGE DAVIES, as a farmer, was much obliged for the able and practical lecture which they had just heard. He wished to know if the learned professor could tell him how red clover could be retained on light soils from January until June. He had some years ago

conversed with Dr. Pepper on the subject, and was now in communication with Mr. Nesbit, but the latter gentleman had not answered the question he now put.

Dr. VOELCKER said, this question was a most important one, which it would be most desirable to solve. About four years ago, he paid some attention to what was called "clover-sickness;" and, like most beginners, in two mon hs he fancied he knew something about the matter, and threw out some suggestions, with a view to remedy the evil. Having, however, followed up the question in various operations, and in the laboratory, and after some long correspondence, he had come to the conclusion that, upon the subject of clover-sickness, he knew as much or as little as the man in the moon.

Mr. DAVIES asked if the fermentation of ordinary manure would render chipped bones sufficiently soluble to be of use to the crop?

Dr. VOELCKER thought it would be quite sufficient; and, after one turning, the bone-dust would disappear. It would, in his opinion, be a very great advantage to use bone-dust in that way.

Mr. PAYNE inquired if the Professor recommended long manure to be ploughed in, or used as a top-dressing?

Dr. VOELCKER said, in a very stiff land it would be better to plough it in, as in that way they obtained the full advantage of the manure.

The CHAIRMAN, in the course of some observations, asked if the plan recommended for keeping up the wheat was by stiffening the straw? If so, superphosphate would be much more likely to do that than ammonia.

The PROFESSOR said he knew, in some instances, that superphosphate stiffened the soil; but that was a different thing from recommending it for the purpose of stiffening the corn. Ammoniacal manures certainly had a tendency to make corn go down, and should, therefore, be used very carefully.

Mr. GEORGE DAVIES then moved, and Mr. GEORGE WATTON seconded, a vote of thanks to the lecturer, which was cordially carried and acknowledged.

THE PROGRESS OF AGRICULTURE.

(From the Mark Lane Express.)

Forward! forward! was the watchword of one, who for a quarter of a century held almost the whole of Europe in abject submission to his iron will. In taking leave of the old, and welcoming the new year, we shall use this signal in a far different and more beneficial sense—that is, if to promote the welfare of mankind, and render the means of subsistence more abundant, and consequently more accessible to the masses, be preferable to spreading misery and destruction among them. We apply it to the progress of agriculture, and call upon the cultivators of the soil to adopt it as their principle of action—not to rest satisfied with past attainments, but to bear in mind that the extent to which improvement may be carried is indefinite, and that every fresh advance in its career opens up new sources of power.

In the cultivation and general management of the land a great advance has been made. Twelve months ago the subject of steam-ploughing was warmly debated, and many practical men were of opinion that, owing to physical impediments, it never could become of great utility. We, however, then spoke of it as a prospective victory; and its practicability has since been demonstrated by Fowler, Boydell, and others. The American reaper and the thrashing machine have received important improvements at the hands of various machinists. The general labour of the farm has been facilitated and rendered less onerous and expensive by the modern improvements in implements, long in use. And thus the processes of husbandry, aided by the machinist, have been largely accelerated.

The management of the land, too, has occupied the attention of agriculturalists; and if the vexed question of deep and shallow drainage is as unsettled as ever, the *general principle* it far better understood. It is by collision that sparks are produced from flint and steel, and it is equally by the collision of opinions that truth is elicited. When practical men cannot agree upon such points, a Way or a Nisbet steps forward, and by laying down general rules, and applying the principles of science to the subject, goes far towards showing that both may be right; and that the difference of opinion may

arise from a want of considering the different conditions of the soils, situations, and other elements of the land to be operated upon.

In the productions of cereal and other crops, a great improvement has been effected by the more general and increased application of chemical manures, the nature and value of which have been defined and explained by our agricultural chemists. To apply the right manure to the right crop is as necessary on the farm as to have "the right man in the right place." Science if not yet understood by farmers generally, is now appreciated by *all*, and an *anti-book* farmer would find himself as much out of place at an agricultural gathering as an Anti-Bakewell Leicester sheep, or an Anti-Colling's shorthorn. Under the new system, cereal crops are now produced to an amount which no man would have credited fifty years ago; whilst no one now believes the maximum of production has been reached.

In the breeding and grazing departments of the farm, if there was not much room left for material improvement at home, we have the satisfaction of knowing that the character of our British breeds of animals has excited the spirit of emulation abroad. Large purchases of breeding cattle and sheep have been made by foreigners at fabulous prices; whereby English breeders have reaped an additional and somewhat unexpected advantage from their efforts. Thus, the Bakewells, the Collings, and their successors have proved benefactors not only to their own country, but to every civilized nation on the globe. The British races of Shorthorns and Devons, of Leicesters and Southdowns, have now acquired a world-wide extension as well as fame.

But, whilst the material prosperity of the agriculturalist has been thus largely promoted by the improvements effected in every department of the farm, what has been the case in regard to the mental progress of the farmer himself? Has he become convinced at last, that "knowledge is power," and that an understanding enlightened by education is safer to trust to, or be trusted, in any employment, than even "the wisdom of our ancestors?" If we may judge by the manner in which a great number deliver themselves at public meetings, we should say decidedly that a vast improvement has taken place in this respect, and that the present race of farmers are as superior to the last generation, in education and manners, as the implements they now use are superior to those of the last century. In fact, the education of the farmer is now a physicial as well as moral necessity. Without it, half the material changes in agriculture would be rendered nugatory by the want of skill and knowledge to avail themselves of them. Still, we want a few more Nesbits distributed throughout the country, to demonstrate the superiority of scientific knowledge to that resulting from mere practice. We must confess that we are in a transition state at present, and must look to the rising generation for that full and general development of mind – destined, as we firmly believe, to convert the farm into a chemical laboratory, and the farmer himself into a man of science.

COLIC IN HORSES.

Years ago, before nosebags were generally adopted, colic was more common than at the present day. In those days horses went out to work early in the morning and did not return until night, during which time, "owing to the want of some convenient mode of supplying them with food when out," they partook of none. The consequence was, they returned home with their vital powers exhausted by work, and with keen appetites, bearing no relation to the capacity of the stomach or to the digestive powers; with avidity they swallowed the food then placed before them; it then entered the stomach not sufficiently insalivated or masticated, rendering it impossible for the grastic juices to act on it, it is a physiological fact that, if food is not properly saturated with saliva in the mouth, it is with great difficulty that chemical action necessary to digestion is set up in the stomach—and colic was the result.

To remedy this evil, Professor Coleman suggested the use of this nosebag, in order that the horse, when standing during the loading or unloading of the vehicle to which he was yoked, might partake of food. The nosebag being generally adopted, cases of colic became rare, and happily continue so.

The horse has a very small stomach when compared with the rest of the alimentary canal, which is quickly emptied, and therefore requires to be frequently supplied with food. From the above remarks, we learn that it is better to supply animals with a small quantity of food two or three times a day, in preference to a large quantity at one time. This plan I have

proved over and over again to be a good practice; but, with all our care (sometimes owing to the exhibition of an improper quantity of deteriorated food, as bran, turnips, &c., or to a draught of cold water when the animal is heated—rarely, however, causing this disease unless in co-operation with other agents, as the effects of water are but transitory without them), some animals have periodical attacks. When such is the case, I always imagine the animal is the subject of intestinal calculus or calculi. The disease, therefore, often consists in indigestion and stoppage of the bowels.

Diffusible stimulus, as sulphuric ether, should be given combined with a sedative, as opium, followed by the administration of 5 drams of aloes, with enemata, in order to evacuate the bowels, which are usually constipated. Blood-letting is superfluous and generally injurious.

Bran should never be given to horses except in the form of a mash. If given dry, it becomes impacted in the intestines, and forms a stoppage to the passage of the ingesta.—*Field.*

GRASS.

A writer in the *Valley Farmer* says:—

It is the design of this article to gratify the spirit of inquiry as far as possible, and aid in the introduction of an article which must become one of its staple productions. We have now had the experience of another season on a large scale, and we can now speak with confidence; there can be no longer a doubt about the superiority of Hungarian grass as a *hay* crop over everything ever tried upon the western prairies.

In the spring of 1853, as nearly as I can ascertain, a Mr. Gleason brought a small quantity of this grass seed with him from Illinois. He had procured a handful of it the spring before from a Hungarian exile who was passing through the country. What became of the exile or the balance of his seed, I cannot learn, nor yet the name of one who has conferred such a favour upon the people of the great west. His name should be written in letters of gold; for that little handful of seed is destined to change the agricultural character of a dozen of States, and give us a product which will stand second only to the *corn* crop upon the rich prairies of the advancing west. This poor exile, and Mr. Gleason with his handful of seed, have done more to promote the agricultural interests of these prairie States, than the Government has with all its seeds in the last ten years. They have done so, because they have given us an article completely adapted to our soil and climate, and one which we needed above all others. This may sound like enthusiasm, but it is a sober reality. We have now in this region, the *best hay country that I ever saw*—until this season and last it was the *worst*. The common grasses are a total failure, yet we have hay of the best quality in such overflowing abundance, that we can feed seven months and still have hay to sell, and this hay was grown upon the high, dry prairies at the rate of three or four tons to the acre.

Mr. Gleason sowed his handful of seed in Illinois, and the next season brought the product to Monroe Co., Iowa, where he sowed again. It may be well to observe that he had difficulty in procuring a piece of ground, as farmers were afraid it might somehow ruin their land. The next season, which was 1854, he distributed among such of his neighbours as had overcome their fears. This year it began to attract some attention in the vicinity, and its popularity has increased as fast as the little handful of seed has multiplied itself. Those who have seen it every year since the first was sown, are now better pleased with it than ever—this year's crop exceeding all that went before it. Within the little circle of its present production, its popularity is unbounded.

In my article last spring, it was stated that a Mr. Bates was the first to introduce it, but a closer investigation traces it beyond him to Mr. Gleason.

I have thought best to secure these facts while they were within reach, because a great effect is destined to flow from this small beginning, and when the little stream becomes a great river, the world will wish to know in what secluded fastness the head spring is situated.

This grass is a crop which has never failed. Wet or dry—cold or hot—it has been a good heavy crop; even last season, when that sturdy giant, the corn, dropped his strong arms, and rolled up his green banners in the dry, hot blasts, his more humble neighbour, the Hungarian grass, spread its rich green mantle over the parched soil, and shot up its luxuriant blades, and waved its golden heads triumphantly, in spite of dry winds and rainless skies. In point of certainty, we have no crop which compares to it; it seems to be exactly adapted to our

loose, deep prairie soils, and is, perhaps, a better crop in Iowa than in its native soil in the country of the Magyars. The secret of its success lies in its strong vitality, stout roots, and adaptation to a dry soil. The roots of our common domestic grasses are too short and slender to reach below the influence of our dry, hot summers, while this production, from its greater vigour and larger roots, can pierce below the reach of drought, and draw up the treasures of fertility which lie beneath.

The only objection which can be urged against it, as a hay crop, is that it must be put in every year; but the immense yield, certainty and nutritive qualities more than compensate for this disadvantage; it is not at all likely that we will soon find a perennial grass which will at all compare with it in these particulars.

In appearance the Hungarian grass resembles Millet, and it no doubt belongs to the same family; but it is much more productive; it affords a better provender, and the seed is more oily and nutritious.

As hay it is superior to Timothy, that old and substantial favourite of every farmer, Horses changed from Timothy and corn to Hungarian grass, begin to thrive on half the usual allowance of corn, and put on that fine glossy coat so much admired by stock growers.

It is not the *hay* alone which gives value to this crop; it produces *seed* at the rate of twenty to thirty bushels to the acre, which in nutritive qualities is much superior to oats; it is heavier, and contains a large amount of oil. In truth the crop is better than a crop of oats and Timothy put together.

The production of this crop is as yet mainly limited to the east half of Monroe county and the vicinity, in which it is supplanting both oats and Timothy, and is reducing the quantity of corn. Farmers are beginning to turn their attention more to cattle than hogs. Up to this time the county has taken up all the seed, "and cried for more," but this season there will be enough to supply the home market and leave a surplus to send abroad—at what price is not yet settled. Farmers here would not be tempted to part with their own supply for ten dollars a bushel.

As an evidence of the popularity of this crop it may be mentioned that the price of seed has steadily advanced for the last three years, notwithstanding a bushel will sow three acres, and produce 25 bushels to the acre.

In the spring of 1855, it could not be sold at any price, except by the quart or gallon; next season the price was $2 50, and last season it started at the same, but soon reached $3 00, then $4 00, and next $5 00 with the supply exhausted, although there was no demand for it outside the circle of its growth.

"ALSIKE," OR PERENNIAL HYBRID CLOVER.

(*To the Editor of the Agriculturist.*)

Having had enquiry made by several of my frends, who were aware of my having cultivated the "alsike clover" for several years, and believing I am the only one who has done so in Canada, I wish, through the *Agriculturist*, to draw the attention of farmers to this new and admirable variety of the *trifolium.*

The alsike clover is indigenous to Sweden, where it has been cultivated for the last century, and has in some cases been known to grow to the height of four feet; but in England, Scotland, and *in Canada,* about two and a-half feet may be the average height. The root is fibrous, and the heads globular, The plant bears a greater resemblance to the white, than to the red clover, and although its stems are recumbent, they do not root into the ground like those of the white clover; in short, it may be described as a "giant" white clover with flesh coloured leaves. It will yield in the old country two mowings annually, but in Canada one mowing, with a heavy second crop for pasture, will prove the most profitable course to follow.

næus observed the alsike clover growing on poor, bare, obdurate clays Morea, where no other plants could be made to vegetate ; and yet under unfavourable circumstances, this clover flourished with an uncommon ance, and yielded shoots as tender and succulent, though not so abun- as if reared in the most richly manured fields.

rm says it is found in Holland, and that he has tried its cultivation, with that of a great number of other clovers placed under the same mstances, and the result convinced him that there is no other kind of r equal to it for the purposes of cattle feeding. With these remarks I cordially concur. Both sheep and cattle are so fond of it that the com- clover, or Timothy and clover mixed, are quite disregarded if access be forced to the alsike, both as pasture and hay. The common red r will last only two years in perfection, and often if the soil is cold and t, nearly half the plants will rot, besides its liability to be thrown out nter killed, and in the second year bald patches will be found in every of the field ; besides that, in September and October many crops left for are lost, in consequence of the heavy rains during that period, while the e clover, on the contrary, ripening its seeds perfectly *the first crop*, and nuing its vigour much longer, much risk and expense are avoided, and a r profit accrues ; and when this plant is once established, it will remain many years in full vigour, and produce, annually, a great quantity of age of excellent quality. Four years ago I obtained from Messrs. son, of Edinburgh, five pounds of seeds, which I sowed to one acre, and was cautious in my experiment, mixed it with about two or three pounds mothy. It stood the winter admirably, and I cut the following year cer- y *not less* than *three tons* of the finest clover hay I had ever seen. In the f June, and before ripening its seeds, I expected to have the second run to seed, which it did not, but produced an unparalleled mass of so close and even and about one foot in length, that I could have fan- t would bear one up to walk over it. The second year I had an equal ity mixed with Timothy, and I found the clover, when the seeds ripened, t the time for cutting the Timothy exactly, without blackenning and going aste, as the common red does. I consider this as its *greatest* recom- dation, for we all know well, that red clover and Timothy, the usual re sown, is on account of the inequality of ripening but ill suited for cing an abundant crop of *first class hay*, as the one or the other must be lly sacrificed. The third cutting last year was heavier than either of rmer, such as only a first rate machine (Manny's) could have given the *e grace* to. By shaking I got as much seed as has covered four acres as fine a plant, and as thick as can be expected, and I feel confident in g twelve tons of hay from the piece this year.

Fleming, the Agricultural Society's seedsman, has procured a small ity of seed from Britain, and has my order for all I can sow this spring e advised, privately, some friends to order from him at least as much as

will sow one acre (4 lbs.,) and give it a trial ; I now desire to give my view regarding it, a much wider circulation, and if I can only persuade 100, or even 50, *intelligent* farmers to make a trial of an acre, or even half, and report the success to you, I feel confident that red clover, both as a mixture with Timothy, and for forage by itself, will soon be numbered among the grasses that were in Canada, and am vain enough to believe, if spared ten years, that it will be generally acknowledged I have done some good for my adopted country. Mr. Editor I beg of you, as you are more able than I am, to draw attention to this subject. Don't let it die away as the dream of an enthusiast. I am a practical man, and the number of years which have elapsed since I first got the seed from Scotland, must be held as a proof that my views have not been forced on the public until I was myself *thoroughly convinced.* I give my name to your readers without fear, believing it a much better system than that *sub rosa,* where a mere theoretical tyro may, by a superior faculty in the art of composition, throw dust in the eyes of a common sense farmer by almost persuading them that turnips *is* but *improved potatoes.*

Yours, respectfully,

PATRICK R. WRIGHT.

Cobourg, Feb. 1, 1858.

WESTERN N. Y. FRUIT GROWERS' SOCIETY.

The annual meeting of this important Society, was held at Rochester, N. Y., during the last month, Several points of great interest to fruit growers were discussed at this meeting, and as some of the most extensive nurserymen, and most intelligent cultivators of fruit took part in the discussion, we think our readers will be interested and instructed by a perusal of their remarks.

The first question discussed was—

1. What Soil is Best Adapted to Produce the Apple in its Greatest Perfection both Tree and Fruit?

L. F. Allen of Black Rock, thought there were several varieties of soil adapted to the growth of the apple. From the extremes of Canada, to the cotton growing districts of the South, the apple will succeed. It is not hard to please, either in soil or climate. Had he the opportunity, when planting an orchard, of selecting a soil to his liking, thought he could select one in which both tree and fruit would succeed. Still, others might select a different soil and do well. He believed that Western New York, from the Niagara River, (below the falls,) to Syracuse, was the best fruit growing district in the United States. He could also speak favourably of portions of Canada West, Northern Ohio and Eastern Michigan, but for excellence—*concentration*—of flavour, none equals Western New York. As we go South and West, and find richer soil or a warmer climate, the fruit becomes larger, but poorer—*dilluted.* Apples may be said to be local in their character. A fruit is generally better where it originated than anywhere else. The Esopus Spitzenburgs raised in other parts of the country bear no comparison to the Spitzenburgs of Ulster county ;the Newtown Pippin is nowhere so good as on the Hudson River. Our Rhode Island Greening is not the *Greening* as it grows in Rhode Island. Soil, temp rature and other causes so affect the character of fruit that varieties, excellent in one locality, are almost worthless in others. Mr. A. had seen apples grown in perfection on a good loam, on stiff clay, and almost, on a blowing sand. Cox, the old pomolgoist, described his orchard as a moving sand, and yet he raised the Newtown Pippin, the Vandervere, and other good sorts in perfection. He had seen excellent orchards on the poorest granite soils of New England. The apple seemed designed by Providence as the general fruit of man.

L. B. LANGWORTHY, of Monroe Co., inquired if Mr. Allen had noticed that particular varieties required a particular soil to bring them to perfection.

Mr. ALLEN thought there was something in that—some sorts seemed refractory. They refused to give their excellence unless grown in a peculiar soil; perhaps similar to that in which they originated.

Mr. SPENCE, of Yates county, thought that the apple could adapt itself to almost any soil, and that climate had more to do with its growth and perfection than was generally supposed. We may prepare soil in the best possible way for foreign grapes, and they will not succeed, but as soon as we cover them with glass, so as to make a different climate, we grow them in the greatest perfection.

E. H. HOOKER, of Rochester, considered the question to be, not on the best localities for fruit, but the best of the various soils in the same locality. The constituents of the surface he would not consider as important as the nature of the subsoil and the condition of the drainage. Never saw much difference in apples from difference of soil, but the fairest is oftentimes from sandy soils. Had always found the best orchards on land with a good natural drainage.

P. BARRY, of Rochester, considered the question to be, not on what soils will the apple grow, but which is the best for it. Light soils would produce good fruit, but they require constant and heavy manuring. Dryness of bottom is important, in fact, it is indispensible. If the root is in water it becomes cankered, and the tree destroyed. Would prefer a well-drained clay loam for almost all fruit trees—even the peach would grow stronger and live longer on such a soil than on the more sandy, if the subsoil was dry. His ideas of the changeableness of the character of fruit by soil and climate had been greatly modified of late: even the Fameuse, which he and others had considered almost worthless at the West, he had seen in Southern and Central Illinois, large and fine flavoured. The Pome Gris he had found excellent in Central Illinois, as well as the Newtown Pippin, and the Esopus Spitzenburg as fine as ever grew on the Hudson.

H. E. HOOKER had received Newtown Pippins from St. Louis as fine as he had ever seen—large and good.

J. J. THOMAS, of Union Springs, thought we gave too much importance to the local character of the apple. He had seen fine Newtown Pippins, grown in Cincinnati. The Ohio Pomological Society recommends thirty sorts for general cultivation in that State, and they are, all but four, varieties of Eastern origin.

Mr. ALLEN had tasted the Western fruits with some of the gentlemen present, and they did not then express opinions of their excellence as confidently as now. In the Cincinnati market you will find almost all the fruits exposed for sale are local varieties, or acclimated, such as the Willow Twig, or Yellow Bellflower, which he had seen almost as large as pumpkins. It is so in all parts of the United States, some local fruit is the favourite, and most generally found in market. Believed with Mr. Barry; but a soil naturally dry—drained by the Almighty — is what is needed. Land, artificially drained, would not do as well for an orchard as that which was naturally dry. Would not depend upon tile, which might become choked by any mischievous rat. Would rather trade off an unsuitable farm than attempt to drain it for the purpose of raising fruit.

H. E. HOOKER agreed with Mr. Allen. Had an orchard on a wet subsoil, a springy side hill, and has tile-drained it, but never picked a peck of good fruit from it, and did not expect to.

T. C. MAXWELL, of Geneva, was surprised to hear the idea advanced by the two last speakers that draining was a poor investment. His experience was the opposite of this.

Dr. SPENCE was sorry to see draining underrated. It would pay well, and as much so for orcharding as for farm crops. Draining, whether natural or artificial, is upon the same principle and produces the same results—the removal of surplus water from the roots. Have drained orchards with a wet subsoil, and with the most desirable results.

J. VICK, of Rochester, thought that before any inference could be drawn from the experience of Mr. Hooker, or any argument founded upon it, he should tell us how his land was drained. It may be drained thoroughly, or it may be only half-drained—a mere apology for draining, from anything that we know.

Mr. BARRY—that is the question. Perhaps Mr. Hooker's land was no better after what draining it received than it was before. The draining of springy side-hills has always been difficult. How best to cut off the springs was a question that excited the most earnest discussion throughout England, and perhaps but one man had learned to do it well.

R. R. Scott said that Smith, of Deanston, had taught the true way of draining such hills, by running the drains across, and thus cutting off the spring at any point.

Mr. Hooker had drained down the slope, and the tile were in some places 4 rods ap while in others, where draining did not seem to be so much required, they were 10 rods more apart. The surface of the land is broken, so that it was found impracticable to lay drains in straight lines or at regular distances, or of uniform depth.

P. P. Bristol, of Dansville, had been much interested in the discussion, but land c not be considered drained suitable for an orchard because tiles were laid through it at tain distances, without reference to the peculiarities of soil, situation, &c. Drains should laid close enough to do their work well no matter what the distance required may be. an orchard on the border of Cayuga Lake that was in a fine bearing condition for several y and until the present high water in the lake. This orchard is now only two feet above level of the lake, but previously, when the lake was at its usual height, it was from six eight feet above. Many of the trees are dead and the remainder are in a dying condit As the only apparant reason for the destruction of this orchard is the saturation of the ea with water, it seems evident that if this water could be removed the land would be restored its former fertility. Here, then, we have a fact showing the advantage of underdraining orchards.

This subject was continued to some length, but nothing of especial interest was suggeste

2. Best Soil for the Pear, Peach and Cherry.

H. E. Hooker would prefer for the pear a strong clay soil, drained; but had seen t pear do well in situations quite damp. Had not noticed any difference in regard to blig from difference of soil.

L. F. Allan thought the pear a very capricious as well as delicious fruit. Think we a a good deal in the dark about its cultivation. Had invested more dollars in pear culture th he cared to name, and the balance was always on the debtor's side. The old pear trees Detroit, which are now about 100 years old and flourishing, stand in a *clay loam*. Many these trees are from 50 to 60 feet high and large and symmetrical, bearing from twenty sixty bushels of fruit every year. On the Canada side of the Niagara river, near Que ston, are hundreds of old pear trees which were planted at the time of the Revolution b Tory settlers from the States with seeds which they brought with them from New Jers and some other parts; the soil is heavy and the trees are in a flourishing condition, and u affected by the blight—few of the apple trees then planted now stand. Some of these tre owned by an acquaintance of mine, I induced him to graft with scions which I let him ha from my garden, among which were the Marie Louise, Glout Morceau, Bartlett, Wint Nells, and one or two other varieties; he grafted them thirty feet high, and they now be splendidly. The soil where these trees stood is a heavy clay; on the opposite side of t river, in a lighter soil, many pear trees have blighted.

P. Barry said the *Peach* required a dry soil. A good, substantial, dry loam was best f both tree and fruit. The *Cherry* is impatient of moisture. A dry, loamy soil is best, thou it will succeed in a clay loam, if dry. In answer to an inquiry, Mr. B. recommended f family u e Early purple Guigne; Belle de Orleans, a light variety, not troubled b birds; Governor Wood, a very fine and hardy variety; Black Tartarian; Black Eagle, a Reine Hortense, large and hardy. For a very late sort he would recommend Belle Magni que; and for market he would add Napoleon Bigarreau, Rockport Bigarreau, and Ekhorn, Tradescant's Black Heart.

Dr. Spence found the cherry to be particularly injured by moisture. He had an orcha of fine bearing cherries. Last year one of the under-drains became stopped, and the con quence was many of the trees turned yellow, and finally died. The soil a clay loam, and wh drained, admirably adapted to the cherry.

H. N. Langworthy, of Monroe County, had grown the cherry on light sandy soil, such is usua ly called here oak openings, for 20 years, with excellent success.

II. 1. Can the Cultivation of the Grape on an extensive scale be made profi able? 2. What Varieties are best adapted to Western New York?

Mr. Barry said that the Isabella was the only variety of an established reputation that h would be willing to plant exclusively. Several new varieties are claiming attention, a promise to become very valoable acquisitions.

L. F. Allen agreed with Mr. Barry that the Isabella was the only one sufficiently know

to recommend, but expected that in a few years other varieties will prove far better than that. The Isabella will not ripen in one locality out of ten. Hundreds of pounds of unripe Isabellas are sold in our markets a every year. On the Hudson River, at Croton Point, it is fine, and also in some favonred localities in Weestern New York.

Dr. SPENCE thought the Isabella would ripen in very many places in Western New York. It will ripen along the shores of Seneca Lake as well as at Croton Point.

H. E. HOOKER could not unqualifiedly recommend any grape for general cultivation, though he thought the Isabella the best for this climate, and would succeed in many localities. Thought favourably also of the Diana.

W. B. SMITH, of Syracuse, had no difficulty in ripening the Isabella. It bears large crops of fine fruit, and for one, he was satisfied with it.

J. J. THOMAS said the Isabella would succeed at all places, but in many it does well. We can recommend this variety for favourable, warm situations. Last season was very cold, and unfavourable for ripening the grape, and yet within a mile of his residence is a vineyard where the fruit was thoroughly ripened.

T. C. MAXWELL would recommend the Isabella. Saw beautifully ripened specimens from Bloomfield last season, although the season was so unfavourable.

Mr. PECK, of Bloomfield, has a vineyard of 100 vines, which last season bore seventy-five bushels. Sold six hundred pounds last fall in Buffalo, at 15 cents per pound. Last year sold a quantity in New York at 22 cents per pound. Would recommend the Isabella for general cultivation in Western New York. His land is a clay loam, naturally dry, descending to the north and east, and shaded on the south by an old orchard. With good cultivation the Isabella will ripen in all seasons, and in most locations. The difficulty is, people neglect their vines and then charge the evil to climate and situation.

3. CAN GRAPES BE PRESERVED IN A FRESH STATE FOR A LONG TIME AND IF SO, IN WHAT MANNER?

Mr. PECK observed that there was no difficulty in keeping grapes that were thoroughly ripened. When grapes become ripe the stem cures, or shrivels, and the fruit keeps plump. After picking and selecting the fruit, put them in half barrels, sawed in two for the purpose. Baskets are not stiff enough, as they give on being moved, and bruise the berries. Keep them in an upper room until the first of March. Pack them for market in boxes, holding about six pounds. Have sent them to Iowa by express with safety.

W. B. SMITH packed grapes in tight boxes between batting last year and kept them until the 10th of June. They were of good flavour, although a little musty from the cotton.

C. P. BISSELL had kept them until March in the way described by Mr. Smith.

L. F. ALLEN said the grapes of commerce came to us packed in dried saw-dust. They were evidently packed before becoming ripe.

Mr. PARSONS had some experience in preserving grapes. For the last 11 years had kept grapes until the first of April. Generally put up about 10 bushels. First commenced putting up in tight boxes which he kept in a chamber, but after about two months they wilted, and were useless. Next season used batting and more care in packing, but not sufficient to keep them. A few bruised grapes will spoil a whole box. Next, got tight boxes and placed cotton batting at the bottom, covered with a cloth. Pick on a dry day, remove all bruised berries, clean from any dust, and put about four layers carefully into the box. Put on the cover and allow the box to remain in the garret where the thermometer is often down to zero. In this way they keep free from mold and all bad taste, and retain their flavour. Great care must be taken in handling, so as not to bruise them.

Dr. SPENCE said that vegetable physiology shows us that the juice of grapes is not contained in one sack, but in separate divisions and delicate cells. Whatever method is adopted for preserving them it is necessary that they be kept from being bruised, or these cells will be ruptured. Generally kept grapes in boxes, between cotton, in the garret, until very cold, and then in the cellar. At first failed, but soon learned to handle them carefully, and now succeeds.

Mr. FOWLER thought freezing did not injure grapes.

Mr. PECK observed that when the stem was dry and shrivelled, showing that the grapes were ripened thoroughly, frost would not injure them, but when unripe they were injured by frost.

4. What is the best Method of Pruning and Cultivating the Grape?

Mr. Peck, of Bloomfield, gave his practice of pruning and cultivating the vine as follows:—Commencing by planting a vine two years old, I let one cane grow the first year, and in the fall cut it back to six inches from the ground; the next season I grow two horizontal canes one each side of the stem, letting them run about six feet each way, and then pinching them off; the next year, from these horizontal canes I train uprights, parallel to each other, about fourteen inches apart, to the top of the trellis and stop them; the next year I prune on the side shoots to two buds. I practice the renewal system with the uprights. Always summer prune when in bloom. The vines stand 12 feet apart each way with dwarf pear trees occupying intermediate rows, and are cultivated with the plow and cultivator. One hundred vines and thirty-five dwarf pear trees occupy half an acre of ground. The rows run north and south. I obtained this year seventy-five bushels of grapes, weighing, at the rate of forty pounds to the bushel, three thousand pounds. The vines have been planted four years being two years old when planted. I do not think taking off the leaves to admit air and light as practiced by some, any benefit, but, on the contrary, an injury.

P. P. Bristol having been requested to describe his method of pruning and cultivating the vine, observed that the pruning of the grape had been practised from the earliest times as all past experience had shown this to be an essential operation, for the production of good fruit, on account of the tendency, in all the grape genus, to a superabundance of wood and foliage. The question now naturally arises, how much and when the vine should be pruned? Different cultivators have practised different methods. He would confine his remarks to the pruning of the hardy grapes in this climate. As the pruning and the culture are inseparable, it would also be proper to speak of the culture of the vine. Plants from two to three years old, he considered the most favourable for transplanting from the nursery. The ground where they are planted should, in all cases, be underdrained. If the fruit is intended for market and table purposes, the vines should be planted in rows each way, from six to eight feet distant. Some think that 16 feet is a better distance. Mr. McKay, of Naples, has obtained from one acre of Isabella grapes, standing 16½ feet apart, 11,000 pounds. The proper distance for wine grapes is from 3 to 4 feet each way. My system of pruning is, the first year to cut within a foot of the ground—the second year cut to about 3 feet of the ground, and allow about three buds to grow. The pruning should be done in the fall, or early winter. The wood of the vine is porous, and if pruning is delayed until spring, much of the sap will be lost by bleeding, and the vine injured. Have known vines to die from bleeding. All cuts should be made some distance from the bud—about an inch; if close the bud will die. The portion of wood left will die and fall off. The Catawba would ripen here if very closely pruned.

For training preferred post and wire trellis, and arrange the vine in the fan form. Summer prune from 20th of June to 10 of July. Take off the wood to within a joint or two of the bunches of fruit. Generally remove about half the wood and half the fruit; that which remains will weigh as much as though the whole were permitted to remain, besides being finer in every way. This year out of 3,000 pounds, had not 3 bushels of imperfect or unripe grapes. The trellises run north and south, are seven feet high, and from experience he would prefer seven feet apart.

J. J. Thomas had had the privilege of examining some of the grapes grown by the previous speaker, and could testify to their excellent character. Many of them were seven eighths of an inch in diameter.

5. 1. Is Fall or Spring the best time to Transplant? 2. What kinds do be transplanted in the Autumn, and what if Spring?

Mr. Barry planted from the falling of the leaves until they started again in the spring. Presuming that the soil was in proper condition, did not consider the time important. Would plant evergreens in the spring. Gooseberries, currants, cherries, and other things that start very early in the spring, it would be better to plant in the fall. The mode of planting, however, is more important than the time.

Dr. Spence considered the statement of Mr. Barry very correct for nurserymen, or in fact for any one whose land is always in good condition. Much of our land is clay, and in a wet time is like mortar. Mr. S. preferred to wait until the land is dry and mellow before planting although he had to wait for this until very late in the spring.

L. F. Allen planted any time in the spring when the ground is dry enough. If trees were obtained in the fall, heeled them in and never noticed any difference between trees obtained direct from the nursery in the spring, or those heeled in during the winter.

P. P. Bristol had planted both in spring and fall, and had always been successful.

WILD GRAPES OF CANADA.

Mr. W. H. Read, sends to the *Country Gentleman*, a drawing of a wild grape, found by him on the banks of the Chippewa Creek, in the year 1855. He says :—" The variety struck me at once, very forcibly, as one of great importance. Its captivating and unusually symmetrical clusters, at first sight carried me quite away. I threw off my hat and coat, and quickly ascended the vine to the height of 80 feet or more, where I could pick at least half a bushel of the most perfect grown clusters I ever beheld. I tasted, and in my loneliness cried out 'Superb!' 'Superb!' responded echo. I ate heartily, and thanked Dame Nature for so great a prize—procured a bundle of cuttings and then started for home. The vine runs through and covers the entire top of two medium sized elm trees, and is, I judge, a full century old—a wilding of great beauty. How it came there no one knows—probably carried by birds from some Frenchman's garden, and dropped in the wood upward of a century since.

"Bunches very handsome, symmetrical, good size, compact, heavily shouldered ; berries medium size ; skin thin, black, covered with a bloom ; flesh tender, melting, without pulpiness, foxiness or musky flavour, sweet and excellent. The wood is strong, short jointed, of a reddish iron color ; foliage very large and thin, green on both sides, having no hair or cotton, and unmistakably shows no kin to the Fox. Important as a parent to cross with foreign grapes, on account of its extreme hardiness and early maturity, as I found it ripe on the 10th of Sept., on the original vine in 1857.

" I will send you a drawing and characteristic of two other wildings, found the present year, of which I took a sketch at the time. A plant of the Chippewa in my garden will probably bear fruit next year ; if so, you may see some of the clusters."

SUGAR FROM THE CHINESE CANE.

THE QUESTION OF CRYSTALLIZATION SETTLED.

The opportune introduction of the Chinese sugar cane into this country, and the general success in experimental planting, stimulates our agricultural friends in all positions to an extent truly pleasing and surprising. Already we have seen it stated that not less than a hundred thousand acres have been devoted to the cultivation of it in this country the present season The experiment of manufacturing sugar and molasses from it, therefore, will be tried on a scale sufficiently large to determine the whole question of its value for such purposes. There are fields of it in every State and territory in the Union, and from various quarters, both at the North and South, and even in the far Western prairies of Illinois, says a Chicago paper, they are commencing its cultivation. We hear that the crop is approaching maturity, and that preparations are being made to manufacture sugar. It has been extensively planted in our own State, and some specimens which have fallen under our notice exhibit an extraordinary growth.

It is estimated that these 100,000 acres of the Chinese cane will yield on an average 300 gallons to the acre of syrup, good for table use.

The manufacture of spirit from the sorgho also may now be carried on by our farmers in the winter season, when there is no other occupation for them, at the rate of a gallon of proof spirit for each gallon of fermented syrup. This will find a ready sale at the rectifier's, who will turn it into alcohol for camphene and other purposes. The quantity of alcohol, says a writer well versed on the subject, now used for purposes of illumination alone, to say nothing of varnishes, chloroform, and medicinal extracts, is enormous, and was beginning to have a serious effect on the price of bread, owing to the wholesale destruction of the cereals required to produce it. Now, however, we have found a substitute, which, besides supplying syrup and alcohol, will also yield from the same crop a large amount of forage and grain for the fattening of stock.

But while the grand experiment of sugar growing in the temperate latitudes approaches its culmination, multitudes are still in doubt whether pure, well crystallized sugar can be made from the juice of the Chinese cane. For ourselves, the evidence in the affirmative is entirely conclusive on that point. Such is the verdict of the best French chemists whose testimony has been recently communicated to the Patent Office, and will be given to the public in the forthcoming report of the Commissioners.

One class of chemists, among whom is a Dr. Jackson, of Boston, have assumed, as the result of their hasty experiments, that only glucose, or grape sugar, could be made from the juice of the sorghum; but more careful and thorough investigations show that the greater portion of its saccharine matter is crystallizable. Mr. Herey, of France, contends that no uncrystallizable sugar pre-exists in the cane, and that the formation of glucose sugar is only owing to the action of the salts contained in the liquid during the manufacturing process. "Be it as it may," continues the report, "it is certain that the greater portion of the saccharine matter of the juice is crystallizable, and may be obtained in the state of crystals, if, after rapid boiling and filtering, the clear fluid be quickly evaporated, the latter operation being a condition of absolute necessity in sugar making, as, by slow boiling, at a temperature of 112 degrees, or even exposure for a considerable time to a temperature below the boiling point, glucose may be formed from the purest crystallized sugar dissolved in water. On the contrary, if the concentrated solution of sugar be heated beyond 230 degrees of Fahrenheit, it undergoes alteration, and is changed, at least in part, into uncrystallizable sugar, or saccharine mucilage."

Mr. Wray, of London, who is now in attendance upon the National Fair at Louisville, and who has, perhaps, more experimental knowledge upon the subject, than any other man in the world, is quoted as good authority by the Commissioners, on the question of crystallization, and we presume that the experiments which he is now making from day to day will be equally conclusive to the public mind. He has devoted years to the subject, pursuing his investigation in Africa and France, as well as this country, during the present season, and has obtained a patent for his process of sugar making in England.

Assuming, then, that superior sugar can be made from the juice of the sorghum, it is hardly possible to exaggerate its importance as an addition to the crops of the temperate latitudes. Its value was discovered at just the period when the culture of the sugar cane at the South had become a failure, and when also the general consumption of sugar began to outrun production.

The world demanded that by some means, if possible, the supply should be increased; and, in response to that demand, as if by providential arrangement, the country was supplied with the seed of the sorghum and the imphee, from which we are to have our first harvest of free-labour sugar. It is a great event in the political economy of this country, if not of the world. We pay out annually many millions of dollars for foreign sugar, the crop of Louisiana at best meeting but a fraction of the demand. Last year, it was estimated that the nation consumed not less than 700,000,000 pounds; and this amount, vast as it is, must continually increase if a supply cannot be obtained. In the Chinese sugar cane, we are now confident that we have the source of an almost unbounded supply. It will flourish everywhere in the Union.—*Carolina Times.*

BUTTER MAKING AND BUTTER.

One of our lady correspondents requests us to give some account of "butter-making"—how and when butter was invented—stating that such information would be interesting to many of our readers.

The origin of butter-making is unknown. From time immemorial, butter has been made and used by the natives of Western Europe. Little is said about it by ancient writers. Galen and others do not mention it as an article of diet, and it is probable that neither the Greeks nor Romans employed it in cookery, nor set it upon their tables as food, in the same manner as it is enjoyed by us. As butter melts and becomes liquid in 90° Fah., this may account for the ignorance of ancient authors as to its use in cold countries in their day, because the seats of ancient learning were confined to warm climates, and geographical knowledge was then very limited. Through the indomitable courage and enterprise of modern travellers we have been made acquainted with the customs and habits of almost all the tribes and nations—civilized and savage—so that we know of butter being used among many of the barbarous Arab and Tartar tribes inhabiting mountainous regions; and no doubt it has been known to them for many centuries. The Tartar, carrying milk for his frugal meal in a leathern pitcher slung over the crupper of his saddle, would perceive, after a hard ride, that there had gathered on its surface a rich yellow substance, unknown to him before, and which could have been produced from the milk alone. The cause of its development would readily suggest itself, and its pleasant flavour would incite him to reproduce it in the same manner. This is

the way butter is now churned by some of these nomadic tribes. The milk is placed in a bag made of skin; the Tartar slings it across the saddle, mounts his steed, and trots up his butter. This, we believe, could not have been the way butter was first discovered by the inhabitants of Western Europe, as their most ancient practice of churning consisted in agitating the milk in wooden vessels; but how or when they discovered the art, we shall never know.

In Palestine, and other warm countries, olive oil holds the same place that butter does with us. As an article of diet, we are only acquainted with the butter made from cow's milk; but butter made from the milk of the sheep, goat, buffalo, and ass, are known and used in various countries, especially in Asia. Some tribes of Arabs use the butter (called ghee) of the buffalo, which they drink clarified in a liquid state. In the East Indies there are breeds of goats which give a large quantity of milk; and among the hill tribes of the Himalaya mountains they take the same place as the kine tribes with us. One of these goats, lately brought to this city from Calcutta, (and by a Mormon family, strange to tell!) yielded on shipboard from six to eight quarts of milk daily. We really hope that some of our enterprising agriculturists, who have devoted so much attention to improving live stock, will endeavour to introduce and acclimatize such a valuable breed of animals. They can be raised and fed in mountainous regions where cows would starve. Their milk is good, their flesh excellent, and their hair makes strong and durable fabrics for cold weather. Goats' milk and butter are also common in some parts of Europe.

Butter is the oil of milk, separated by the mechanical action of churning, from its other constituents – casein, sugar, and some salts. It exists ready formed in the milk, as oil does in various seeds, and it can be churned from sweet (but not so quick) as well as from sour milk. It is called by chemists *butyrine* and *butyric acid*. In some dairies the whole milk is churned to obtain the butter; in others, only the cream. By the former method it has been asserted that more, but by the latter superior butter is produced. It is our opinion that with proper care there is little difference in the results of the two systems. Grass-fed kine yield milk from which beautiful yellow butter is gathered; on the contrary, stall-fed cows give milk which yields a tallowy-looking butter. This latter kind of butter is oftentimes coloured to deceive the buyer, by annatto, the juice of carrots, and the flowers of the marigold. The colour, therefore, is not always the test of grass-fed milk. Some kinds of feed impart their strong and peculiar flavour to milk. This is the case with turnips, which should never be given to milch cows, except in very limited quantities. In winter, when grass cannot be obtained, the best kind of food is a question of no small importance. Milch kine should receive, at least, one meal per day of steamed or boiled food. The cheapest and best for this purpose are Indian meal, a few pumpkins deprived of their seeds, carrots, hay, and cornstalks; potatoes are excellent, and when cheap should be given freely. Cows which receive one meal per day of boiled or steamed food, during winter, yield at least one-third more milk than those which receive only dry food, the condition of the former at the same time being much superior.

Much has been said about the best methods of treating butter to preserve it sweet and from becoming rancid. Under ordinary circumstances, there is no difficulty at all in the matter; and yet the quantity of inferior (bad butter) in proportion to good butter, which comes into market, is immensely large. As all healthy, well-fed country kine, produce good milk, no bad butter should be found in our markets. It reflects unfavourably upon the intelligence and thrift of our farmers, that such butter is offered for sale. Cleanliness and care are two of the great secrets for making good butter. Holland butter has the highest reputation of any other; this is simply attributed to the great cleanliness of the people of that country, but there are other conditions also necessary. The dishes containing the milk should be perfectly clean, and kept in a cool, dry, and well-ventilated apartment, and the milk or cream which is designed to be churned should never be suffered to become very sour—to have the least odour of putridity. It has been discovered that butter made from sour cream is very liable to become rancid, in comparison with that made from sweet milk, or sweet cream. It is, perhaps, owing to want of attention on this head, during warm weather, that so much inferior butter is made. It requires longer time to churn fresh than sour cream; but the quality of the butter obtained will pay for the use of horse power to churn, even on a farm having no more than five cows. After the butter has *come*, it requires careful manipulation, or working. It makes it tough to work it over a great deal, and the use of much water for washing takes away its fine flavour. The best plan to treat butter is to submit it first to severe pressure, by placing it in a cloth, and squeezing it in a vessel containing a perforated false bottom. This can be done with a cheese press, if not, with a pounder like that employed

for clothes. After all the milk is thus squeezed out, the butter should be lifted and worked over carefully, and afterwards receive one or two clean, cool waters, to wash away every trace of milk. It should then be salted with the best salt, containing a minute quantity of sugar mixed wth it, and last of all it should again be submitted to severe pressure. The treat object in thus treating butter is to remove all the water and milk from it, because these induce incipient decomposition, and consequent rancidity. By churning the cream before it becomes too sour, and removing all the water and milk from the butter, and by careful and thorough salting and working, the best quality will always be obtained.

THE PHILOSOPHY OF BREAD MAKING.

The following remarks on the philosophy of bread making are from Johnston's "Chemistry of Common Life," a work which contains much useful and interesting information in regard to the food, beverages and narcotics in common use :—

When the grain of wheat is crushed between the stones of the mill, and is then sifted, it is separated into two parts—the bran and the flour. The bran is the outside, harder part of the grain, which does not crush so readily, and when it does crush, darkens the colour of the flour. It is therefore generally sifted out by the miller, and is used for feeding horses, pigs, and other animals, or even for applying to the land as a manure.

If the flour be mixed with a quantity of water sufficient to moisten it thoroughly, the particles cohere and form a smooth, elastic and tenacious dough, which admits of being drawn out to some extent, and of being moulded into a variety of forms. If this dough be placed upon a sieve or on a piece of muslin, and worked with the hand under a stream of water as long as the water passes through milky, there will remain at last upon the sieve a white sticky substance, very much resembling birdlime. This is the substance which gives its tenacity to the dough. From its glutinous character it has obtained among chemists the name of gluten. When the milky water has become clear by standing, a white powder will be found at the bottom of the vessel, which is common wheaten starch. Thus the flour of wheat contains two principal substances, gluten and starch. Of the former, every 100 lb. of fine English flour contain about 10 lb., and of the latter about 70 lb."

When a little yeast is added to the flour before or while it is being mixed with water into a dough, and the dough is then placed for an hour or two in a warm atmosphere, it begins to *rise*—it ferments, that is, swells or increase in bulk. Bubbles of gas (carbonic acid gas) are disengaged in the interior of the dough, which is thereby rendered light and porous. If it be now put into a hot oven, the fermentation and swelling are at first increased by the higher temperature; but when the whole has been heated nearly to the temperature of boiling water, the fermentation is suddenly arrested, and the mass is fixed by the after baking in the form it has then attained. The formation of hard crusts on the loaf may be prevented by rubbing a little melted lard over it after it is shaped, and before it is set down to rise, or by baking it in a covered tin.

It is now newly-baked bread, and if it be cut across it will appear light and spongy, being regularly sprinkled over with little cavities, which were produced in the soft dough by the bubbles of gas given off during the fermentation. This fermentation is the consequence of a peculiar action, which yeast exercises upon moist flour. It first changes a part of the starch of the flour into sugar, and then converts this sugar into alcohol and carbonic acid, in the same way as it does when it is added to the worts of the brewer or the distiller. As the gas cannot escape from the glutinous dough, it collects within it in large bubbles, and makes it swell, till the heat of the oven kills the yeast plant, and causes the fermentation to cease. The alcohol escapes, for the most part, during the baking of the loaf, and is dissipated in the oven.

New-baked bread possesses a peculiar softness and tenacity which is familiar to most people, and though generally considered less digestible is a favourite with many. After two or three days it loses its softness, becomes free and crumbly, and apparently drier. In common language, the bread becomes stale, or it is stale bread. It is generally supposed that this change arises from the bread becoming actually drier by the gradual loss of water; but this is not the case. Stale bread contains almost exactly the same proportion of water as new bread after it has become completely cold. The change is merely in the internal arrangement of the molecules of the bread. A proof of this is, that if we put a stale loaf into a

closely covered tin, expose it for half an hour or an hour to heat, not exceeding that of boiling water, and then remove the tin, and allow it to cool, the loaf, when taken out, will be restored in appearance and properties to the state of new bread.

The quantity of water which well-baked wheaten bread contains, amounts on an average to about for y-five per cent. The bread we eat, therefore, is nearly half water ;—it is, in fact, both meat and drink together.

The flour of wheat and of other kinds of grain contains water naturally, but it absorbs much more during the process of conversion into bread. One hundred pounds of fine wheaten flour take up fifty pounds, or half their weight of water, and give 150 pounds of bread. Thus, 100 of English flour and 150 of bread contain respectively—

	The flour contains	The bread contains
Dry flour.....	84	84
Natural water,.....	16	16
Water added,.....	..	50
	100 lb.	100 lb.

One of the reasons why bread retains so much water is, that during the baking a portion of the starch is converted into gum, which holds water more strongly than starch does. A second is, that the gluten of flour, when once thoroughly wet, is very difficult to dry again, and that it forms a tenacious coating r und every little hollow cell in the bread, which, coating does not readily allow the gas contained in the cell to escape, or the water to dry up and pass off in vapour ; and a third reason is, that the dry crust which forms round the bread in baking i nearly impervious to water, and, like the skin of a potato which we bake in the oven or in the hot cinders, prevents the moisture within from escaping."

CONCRETE CELLAR BOTTOMS.

The facility and cheapness with which the bottoms of cellars may be made clean, sweet, and impervious to water, is generally but little known to house owners; nor the ease and certainty with which water may be excluded from cellars where it is difficult to drain.

In soft and pervious soils, this process is best performed by paving with small stones, laid in sand ; but in common, compact soils, the natural surface, well leveled, will answer all purposes. Make a thin mortar with water lime and coarse sand, of the consistency called *grout*, or so thick that it can be poured from a pail on the ground. Commence with a portion of about eight or ten feet at one end, and throw on sufficient to cover it an inch or more thick, and with a scraper or rake-head, spread it evenly and smooth : then throw on as much clean, coarse gravel as it will absorb, and so continue until it is finished. In twelve hours, or as soon as it has set, sweep the overplus gravel evenly on the surface, and ramp it down with a short plank and pounder, until it is smooth and compact, and in a few days of good weather, it will become like a solid rock. It assists its durability and firmness, to give it several good dashes of water after it is dry.

To render the sides impervious to water, where drainage is difficult or costly, requires that the wall should be laid with mortar originally ; and at the time of constructing the bottom, a good well portioned water-lime mortar should be plastered on, a little higher than the source of water, and well and firmly sticked down when about half dry, and followed by another coat of the same ; when, if a proper time intervenes before there is any outward pressure of water, it becomes as tight as a barrel or tub ; it is always sweet, clean, and cool, and no vermin can enter nor find lodgement.

The sand used in the grout and mortar should be coarse, clean and sharp, and the gravel from the size of walnuts down to coarse sand.—*Rural New Yorker.*

SINCERITY is to speak as we think, to do as we pretend and profess, to perform and make good what we promise, and really to be what we would seem and appear to be.

THE IRON INTEREST.--The Secretary of the Treasury has issued a circular to iron and ore, manufacture that they may be submitted to scientific tests, in order to ascertain their comparative excellence. Congress has made an appropriation of $2,500 for this purpose. The Secretary also asks for a variety of information in respect to the mines and the processes to manufacture. The facts which will thus be collected will be of great value to the iron interest.

English Travellers and Roman Brigands.—Rome Dec. 5. The brigands in the neighbourhood of the Eternal City have just resumed their periodical practice of spoliating such incautious travellers as take more money with them than is necessary for their own wants or less than will suffice to pacify the *auri sacra fames* of highway assailants. On Monday evening a seven o'clock avetturino carriage was plodding its weary way from Civita Vecchia towards Rome, and had reached a spot four miles on this side of Palo, when its farther progress was opposed by seven bandits armed with bludgeons, pistols, and daggers, who stopped the vehicle and proceeded to rifle the passengers, consisting of Dr. Conolley Roman Catholic bishop of Halifax, on his way to Rome to pay homage to the supreme head of the Church, Mr. Blake, and Mr. and Mrs. Harper. The Bishop was eased of £140, besides his episcopal chain and cross, and pastoral ring, a fine emerald, which he wore according to custom. Mr Blake feeling greatly averse to submitting to spoliation, in his turn manfully resisted the outlaws' invitation to stand and deliver, but he was finally overpowered by numbers, after being severely beaten and having had a pistol presented at his head, which fortunately missed fire. Mr. and Mrs. Harper were robbed of their watches, chains, and purses; and altogether the plunder realized by the marauders may be valued at about a thousand scudi, or over £208.

The Winter.—Mr. M. Ryan, the somewhat noted observer of the weather, makes the following observations relative to the winter:—"The signs for the winter are one third milder than those of last winter. This is a lunar calculation as to the number of days in a moon is to the number of days in a moon-and-a-half; or as 28 is to 42; and within two points of the winter of 1852. God has "tempered the wind to the shorn lamb." There are thousands out of employment —we shall have a mild winter and an early spring. Improve the sleighing when it comes for it will not stay as it did last winter." His prognostications seem to have been pretty well borne out thus far.

Cure for Hydrophobia.—A man was cured of hydrophobia in Italy lately, by swallowing vinegar, in mistake for a medicinal potion. A physician at Padua heard of this, and tried the remedy on a patient; he gave him a pint of vinegar in the morning, another at noon, and a third at sunset, which cured him.—*Scientific American.*

EDITORIAL NOTICES.

Durham Bulls.—Mr. George Miller, of Markham, whose stock is of the first class, has some young thorough bred bulls to dispose of. Mr. Miller's address is Markham Village.

"Transactions."—We send along with this number of the *Agriculturist*, a sheet of the "Transactions of the Board of Agriculture." Subscribers of last year will find this to be a continuation of the "Transactions" already in their hands. They will receive the balance of the volume if supplied to us by the Board. We shall probably be able to supply our new subscribers with the remainder of the sheets, but cannot promise those already issued. In special cases, where it is desired to complete the volume for preservation, we may be able to procure the earlier sheets

Prize Essay on Insects.—We have sent to all our subscribers this year, a copy of Professor Hind's Prize Essay on Insects injurious to wheat, &c., with illustrations. This is the most complete work on the subject that has yet appeared in this or any other country, and should be carefully read and preserved by every tiller of the soil into whose hands it may come. We trust that officers of Agricultural Societies will make an extra effort this year to place the *Agriculturist* and the prize Essay in the hands of the members. They will never have another opportunity of procuring so much valuable information at so small a cost.

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