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LOWER CANADA AGRICULTURIST

MANUFACTURING, COMMERCIAL, AND COLONIZATION INTELLIGENCER;

OFFICIAL SERIES OF THE AGRICULTURAL BOARD AND SOCIETIES

PUBLISHED UNDER THE DIRECTION OF

M. J. PERRAULT,

*Member of the Provincial Parliament for the County of Richelieu.
Pupil of the Royal Agricultural College of Cirencester, Gloucestershire, England
and of the Imperial Agricultural School of Grignon, Seine and Oise, France
Member of the Imperial Zoological Society of Paris, &c.*

FEBRUARY 1864.



SPARGERE COLLECTA,

OFFICE—TOUPIN'S BUILDINGS, PLACE D'ARMES,
MONTREAL.

AGRICULTURAL REVIEW.

FEBRUARY.

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Official Dep't.

BOARD OF AGRICULTURE FOR LOWER CANADA.

Montreal, 19th January, 1864.

Present: The Honble. L. V. Sicotte, President; T. E. Campbell, Vice President; Honble. U. Archambault, O. E. Casgrain, and Honble. P. J. O. Chauveau.

The President having explained the object of the meeting, the Corporation of the College of Ste. Thérèse, through Rev. Mr. Thérien, presented Mr. Jules Constant Cazier, as Professor of Agriculture, attached to their establishment.

Mr. Jules Constant Cazier declared that he had been Professor of Chemistry at the Imperial Agricultural school of Grignon, and that he had diplomas proving this fact.

The Board of Agriculture, after a few questions to Mr. J. C. Cazier, resolved:—

That in order to allow the College of Ste. Thérèse to receive the Government allowance for the encouragement of agricultural education, a certificate declaring sufficient capacity for teaching agriculture at the Agricultural School of Ste. Thérèse shall be given to Mr. Jules Constant Cazier, as soon as this gentlemen shall have

remitted to the Board, in the hands of its Secretary, the diplomas and certificates showing that he has been a Professor at the Imperial School of Grignon.

Resolved, That the medals ordered by the Board of Arts and Manufactures for the Industrial Department of the last Provincial Exhibition, be paid according to the account presented; and that a statement of the number of medals awarded, and to whom, be given to this Board, by the Board of Arts and Manufactures.

Resolved, That it is the opinion of this Board that the next Provincial Exhibition be held in September, 1865.

Resolved, That inasmuch as this Board is informed of the existence of twenty Law Districts, instead of nineteen, an additional scholarship of \$50, subject to the same condition, as the nineteen others be established, and is hereby established, so as to have one scholarship for each Law District of Lower Canada.

And the meeting adjourned.

(By order.)

GEORGES LECLERE, Secy.

B. A. L. G.

EDITORIAL DEPARTMENT.

IMPROVED AGRICULTURE.

IT is cheering to the agriculturist of this day to notice the great strides which have occurred in Agriculture and Horticulture. The last thirty years seem to have culminated in a more full application of the sciences to these pursuits. We have waded through the different theories, first of Liebig and next of the various candidates for fame who have presented contradictory views, and all of whom have been mainly instrumental by their failures in establishing the once novel, but now admitted truths of the great chemist. No less useful have been the applications of natural laws illustrated and rendered understandable from the observed effects arising from underdraining and subsoil plowing. These have enabled the empirical farmer to know where moisture should be looked for when absent from his soil. He has found it dilate in the atmosphere, and he has also found that when this atmosphere could find its way through his soil to such depths as to bring it in contact with the surfaces of particles colder than itself, that the moisture would be deposited upon these surfaces; which in turn are properly prepared for all those chemical actions consequent upon the presence of both moisture and atmosphere. He has further learned that moisture so obtained contains large amounts of ammonia, and that water containing ammonia is capable of dissolving an increased amount of such inorganic matters as give strength to plants, and which are again yielded up by their ashes. He has also learned that all the organic matters in the soil which have ceased to grow under such conditions as above named, readily decompose and yield up their inorganic portions as pabulum for surrounding crops. This very decomposition also furnishes increased chemical conditions for action on the less progressed portions of the soil itself. All these enable him to surface plow more deeply in a soil progressed to great depths by underdraining and subsoil plowing. Thus increased depths of surface soils are formed, and increased crops are a natural consequence.

The more spirited operators are fast learning that no farm will produce as much manure as may be used with increased profit; and now instead of American bones

being exported to England and elsewhere, they are all used in the manufacture of superphosphates, and in the form of ground bones. This fact alone is of greater advantage to our country than is all the gold furnished by California. The spirit of inquiry as to the relative value of all wastes shows a more full appreciation for the necessity of an increased amount of manurial matter. Farmers begin to comprehend that common salt is composed of chlorine combined with an alkali, both of which are called for to complete the necessary pabulum of plants; and dirty and refuse salt from the packing houses, tanneries, etc., which formerly sold at four cents a bushel, now sells within two cents per bushel of the price of the merchantable article. When properly combined with lime, the chloride of lime and carbonate of soda may be formed from common salt; and this, when composted with inert inorganic matter, insures its rapid decomposition, fitting it for the use of the soil. Thus all deposits of low lands receive from the surrounding highlands during all time, and including many of the extensive marshes, are again brought into use for the highlands from whence they came,—while increased chemical actions in the soil, from the presence of chlorine, lime, and soda, together with all the inorganic matter of these vegetable deposits, go to perfect conditions such as always follow the application of manurial matters.

Chemists have been taught to believe that chemistry was an exact science, and therefore they slowly yield to the truth so readily noticed by the farmer, that the same inorganic constituents which are furnished to the soil from the decomposition of organic matters, and which cause increased amounts of growth, if taken from lower sources in nature—such as the rocks—will fail to produce the desired results. Thus the farmer has found that superphosphate made by treating bones and other organic matters has high value. He has also found that bird dung, in the form of guano, and containing large amounts of phosphate of lime, is valuable, while those miscalled guanos, which have been so highly recommended by few chemists, and made by grinding phosphatic rocks and volcanic phosphates, have no value. And now we are glad to say that many of our first chem-

ists admit the fact that the condition of constituents decides the value of manures as well as the constituents themselves. They further admit that each time any of the constituents of the rock which go to form soils becomes incorporated with a plant, and is again delivered back to the soil by the decay of this plant, that it possesses new functions which it did not possess before. Thus the potash in the ashes of a burnt hay stack has many times the value of the potash separated from the feldspar rock; in other words, at each appropriation in nature for renewed growth, all the primaries are progressed and rendered capable of entering a higher-classed organism, and that all time has been required for this change of condition now noticeable in the amount of organic product, as compared with such conditions as existed before organisms made their appearance. And yet the primary constituents were the same then as now at least so far as their quantity is concerned. Unless chemists can synthetically form a plant by combining the unprogressed constituents of the rocks, they will have to admit that the progressed constituents have functions not found to be possessed by those which exist in a lower state of nature.

Mechanical philosophy has been more generally applied to the assistance of the agriculturist than has chemistry, simply because the power of observation in mechanical effects is possessed by a greater number of persons. The invention of the mowing and reaping machines has caused a greater breadth of land to be appropriated to the grass and grain crops, because these crops could be cut by merely increasing the animal power. The tedding machine for turning and making the hay represents fifty or more men with turning forks; while the unloading fork for storing the hay in barns again transfers from men to horses the principal part of the labor. The threshing and winnowing machines have reduced the labor of these operations, so as to do away with the inefficient flail, and abridge human labor. The amount of straw has been so increased by the greater breadth of land appropriated to grain-growing, that in turn it, with the increased quantity of hay, has sustained a large amount of animal life—not only ministering to the immediate necessities of man, but sending back to the great warehouses of nature—the soil and the atmosphere—millions of tons of progressed matter to be readily re-appropriated

in the forms of new growths. As population increases, the earth's surface from these causes is rendered capable of yielding increased amounts of products. The use of the subsoil plow and the consequent gradual deepening of the soils, render deeper surface plowing practicable; and thus many farmers have found an extra farm beneath the surface, not noted in their title deeds.

The hoe, the spade, and the digging fork are being displaced by horse implements of various kinds. The potato diggers now in use would alone save as much labor as would enable the agriculturist to furnish many brigades of soldiers for the use of the government. Indeed it is a sorry sight to see potatoes dug at this day by manual labor. Plows have been improved, so as to increase their efficiency, while the amount of power of the draft has been lessened. Horse tools for surface cultivation have displaced the clumsy and inefficient harrow and all the hand tools for corn; and root crops need no longer be cleansed of weeds by hand. The carrot weeders, the horse hoes, the cultivators, &c., may now be used in place of hand labor; and at this time the agricultural implements of America are sold in immense quantities in the colonies of England and France, Africa, the East and West Indies, and South America.

By the cutting and steaming hay, corn-stalks, &c., the amount of food necessary for animals has been materially reduced; and farmers are fast learning that there is economy in putting roots, and mixing them with chaffed and cut feed. Indeed, the book-haters are disappearing, and the improvements of each part of the country are being disseminated for the general benefit. Many of the larger farmers have introduced steam and caloric engines to facilitate the cutting and grinding of feed, threshing of grain and other purposes where mechanical power may be used at less cost than animal power. Progression is the order of the day, and the farming interests, above all others, are benefitted by its onward march.—PROF. MAPES in *Working Farmer*.

SMALL vs. LARGE FARMS

It is a question of considerable importance to the common farmer, whether he shall occupy a large or a small farm; whether he shall confine himself to a small business on a small farm and realize only a small income, or whether he shall extend his area,

and do a larger business and realize a larger income. By a small farm I would be understood to mean one containing from forty to sixty acres, and by a large farm, one containing a hundred or more.

Judging from my own experience and from what I can learn from observation, I am decidedly of opinion that the large farm pays better than the small one, provided it is well conducted—that there is as much done on it according to its size. I know that we are apt, and not without reason, to associate exhausted fields and light crops with large farms, and we frequently say on passing such—“that man has got too large a farm; he had better sell one-half of it, and till the remainder as he ought.” Better for the man, I should say, if he would till the whole as he ought. Slack tillage and mismanagement are not always coupled with a large farm; and when we see a farmer who adopts such a course, in all probability he would pursue the same method if he were located on a small farm. It is in farming as it is in all other kinds of business—there are but few who will succeed. Place these on a large or small farm, and what they do, they will do well, and consequently will make it pay; but better on a large than a small one.

In deciding this question, a man should consider well what he wishes to be. A good farmer can go on to a farm of fifty acres, and if he conducts it well and studies economy, he can support himself and a small family, and that is all. If that is sufficient to satisfy his ambition, then it is all the farm he needs; but if he wishes to be really independent, to have enough and to spare, to have his receipts outbalance his expenditure, to be improving his farm, his buildings, his fences, his stock, then he must have a larger farm, and employ some help besides his own hands. Farmers often say they do not want a large farm, because they couldn't afford to hire the help. This is entirely a mistaken idea. If a man on a small farm can support his family by his own labor alone, certainly if he were on a large farm and hired a man to work with him, the two would do twice the work that he could do alone, and consequently receive twice the income; and one-half of this income, minus the expenses of the man, would be net profit over and above supporting his family. This is why I would advocate the large farms. Not that I think money is the chief end and aim of life, but we do not consider a

man a successful farmer unless he is gaining something, either by way of improvements or in money, over and above his living. We want to see indications of prosperity around his buildings and farm.

A suitable farm for common operations should not contain less than one hundred acres, and the larger it is the greater profits, provided it is well conducted. Thirty-five of the one hundred acres should be in mowing and tillage, fifteen in wood, and fifty in pasture. Such a farm, in a high state of cultivation, will keep from fourteen to sixteen head of cattle. Any man who is capable of being a good farmer would be capable of managing the business of such a farm.

The above remarks I mean should apply to the common practice of mixed farming. There are branches of farming where a man can use considerable capital, and employ a large amount of help on a small piece of land. This, too, is a question for him to decide before he knows how large a farm he wants. If he wishes to be a gardener, then he wants only a garden; if he wishes to become an orchardist, and give his attention to fruit growing, then he wants principally orchard land, and of course not a great number of acres. In any case he should consider well his taste, inclination, and ability, remembering that the larger the business, provided it is well conducted, the better it pays.—*Maine Farmer.*

CANADA HERD BOOK.

The Board of Agriculture for Upper Canada proposes to publish a Herd Book, containing the pedigrees of all pure blooded Short Horned, or Durham Cattle, which have been imported into or bred in Canada up to the present time.

A GREAT POULTRY-SHOW.


THE Agricultural Gazette, speaking of the late show of poultry at Birmingham says:—

“Seventeen hundred and eighty pens completed this year. While this affords an undeniable proof that the public interest in the pursuit remains unabated, the more practical side receives its illustration in the fact that the breeds that offer the most successful qualities are the most largely kept, and while there are sufficient entries in the fanciful sorts to afford competition and amusement, yet the public taste remains fixed on the noble Dorking as our best table fowl, and most profitable in-

habitant of our farm-yards, while numerous admirers remain true to the once semi-worshipped Cochin-China, recognizing and appreciating its laying properties, the ease with which it is reared, and the contented, stay-at-home disposition that adapts it especially to the dweller in a town, or the man with limited space. By means of exhibitions like this, the progress is not confined to entries or visitors, it extends itself to knowledge.— This is not limited to the breeds that were familiar in former times. Then, a fowl was a fowl, except that in certain counties, as Kent, Surrey, Sussex, the Dorkings were known for the table. In others, as Lancashire, Worcestershire, Cheshire, and Yorkshire, Game were kept for fighting; and Moonies, Chittoprets, and Bolton Bays and Grays were kept for eggs. Nearly all other fowls were summed up in one designation—they were 'barn-door fowls.'— The first thing that broke this quiet was the institution of showing; this caused the Cochin mania, and the stone once set in motion has been rolling ever since. Every one is more interested in this than would appear at first sight. Although poultry may still remain among the desiderata to many, yet all eat eggs, and it would be a boon if they were more numerous and consequently cheaper. This has led to inquiries into the capabilities of the different breeds of the Continent, and a desire to possess those that are most profitable. The Council of the Birmingham Show, mindful of their mission, this year encouraged the pursuit by offering four prizes for Crevocœurs, believing their introduction would be an advantage, for the size and number of their eggs."

The competition in Dorkings embraced 260 pens or lots; that of Cochin-Chinas or Shanghais, 163 lots; and that of the Game, 280 lots. The competition for the prizes offered for single cock in the latter class embraced 123 specimens. These were the leading classes as to numbers, though the Spanish, Hamburg, Polish, and others were numerous.

ENGLISH FARMING.

 R. Mechi, the celebrated English farmer, gives a portion of his method of farming in an English paper as annexed. He considers the keeping of a large stock of cattle as very important to success, relying on their manure chiefly to produce the crops that render his system profitable.

We cannot follow his system in this

country, to that costly extent as practised by him; but we may learn from him some valuable suggestions. It appears that he feeds the value of \$25,000 annually to 70 head of cattle, 100 sheep, and some swine! The English call wheat, rye and oats, "corn" and Mr. Mechi's "100 acres of corn," mean so much wheat, &c.

Here is Mr. Mechi's article:

"But, Mr. Mechi, how do you manage to keep so much stock on 180 acres? I see that you have 70 head of bullock and cow stock, young and old, and 100 sheep, beside pigs, all in a growing and fattening condition. You have 100 acres in corn every year, you have very little grass land, and yet I see a good hay and clover stack. Tell us how you manage this."

These remarks are so often made to my bailiff or myself, by practical farmers who visit my farm, that I purpose giving the explanation in your columns, hoping it may prove useful. My first object is always to have a very full crop, by deep cultivation and plenty of manure.

I have generally—

Twelve to fourteen acres of mangolds.

Six to eight acres of Swedes.

Six acres of winter tares, mowed and brought home to be cut up for cattle and horses. The land is then heavily manured, deeply trenched, plowed, and three acres planted the end of June with cattle cabbage, which are now a heavy crop. The other three acres have white turnips.

Eight acres of rape, taken after white peas picked for the London market; the land trench-plowed after peas.

Twelve acres of Italian rye-grass, half first year, half second year's growth.

Seven acres of grass land, fed to the 12th May, then irrigated; cut in June for hay, producing two tons per acre; guanoed and irrigated after the hay is removed, and grazed subsequently with calves and cows. In winter sheep folded upon it eating cabbage, mangold, cake, malt combs, bran, &c.

I have now 100 lambs in fold eating green rape, and they receive every evening in their fold four bushels of wheat chaff, two bushels of red clover chaff, two bushels of cotton cake, one bushel of oats, one bushel of bran.

In this mixture there is the proper material for building the animal frame—they manure the ground heavily—there is no loss by scouring, and they grow rapidly. When water or hoar frost stands on the rape it is brushed off with a long pole be-

fore the lambs go on it. Our calves feeding out of doors on old Italian rye grass, clover, or pasture, receive at night rape or cotton cake, bran, malt combs, hay and straw chaff. In the summer the bullocks all under cover, get tares, or Italian rye grass cut by the chaff-cutter, cotton cake, bran, and malt combs; or in September, October and November, turnips or mangold (with the top*) pulped, cabbage ditto mixed with straw, chaff, cotton cake, malt combs, and bran.

In fact, the main principle is to give mixed food, and to cut up or pulp every kind of green crop, root crop, or grass, and never to let any animal tread down or spoil food that is long enough to cut into chaff.

I expend every year in food for my animals, either purchased of others or of myself, at least £5,000 on 170 acres. This consumed by my animals leaves manure enough to compensate for the wheat and barley sold off the farm—thus preserving or increasing the fertility of my soil, and the bulk of my crops. There is nothing pays better in the manure than cotton or rape cake, beans, malt combs, bran, clover hay.

It should never be forgotten that fattening animals appropriate only a very small portion of the food given to them, and that the bulk of what they eat returns to the land. It is thus easy to understand why we derive so much benefit from their manure. Cows are an exception to this rule; they take much of the goodness out of their food, which we get as milk: therefore their manure is very inferior to that from either fattening or growing animals.

Cake is the preferred of all food, because it contains the elements of lean, bone, and fat in greater proportion than any other food. Malt combs, bran and beans come next.

Straw (according to Mr. Horsfall) gives us materials for fattening cheaper than any other food.

I am indebted to my sewerage irrigation for a very heavy crop of Italian rye grass, one acre of which during summer will keep all my bullock stock and farm horses for a week; six acres keep 100 sheep from March until September. Italian rye grass cannot be grown in summer without plenty of good fluid. I find irrigating with farm sewerage greatly increases my grass and hay crop.

It is surprising how fast and perfectly

you may build up young animals, provided you give them the proper materials in proper proportions. No one has explained this more clearly than Mr. Horsfall, in his two able papers on "Dairy Farming," and "Meat Making," in the *Royal Agricultural Society's Journal*, vol. 17 and 18.

BET SUGAR AT THE WEST.



HE manufacture of beet sugar is attracting considerable attention at the West. The *Prairie Farmer* gives the following account of a large manufactory of this sugar in Illinois as follows:

During the winter of 1861-2, Mr. Belcher the Superintendent of the Sugar Refinery this city, and Wm. H. Osborn, President of the Illinois Central Railroad, with their usual liberality and foresight, imported several hundred pounds of the seed of the best sugar producing beets of Europe, embracing some four or five varieties.—These were distributed gratuitously among the farmers of the Northwest, in order to test the quality of beets grown on different soils.

Samples were collected by Mr. Belcher from a large number of points when grown and carefully analyzed, giving from nearly all satisfactory evidence of richness in saccharine matter. Mr. Belcher went even further, and expressed some juice, boiling it down in an open kettle, when it granulated giving a good yield of very strong grained and pleasant flavored sugar.

Meantime Mr. T. Gennert, of the firm of Gennert Brothers, of New York city, had made a journey to Germany, carefully investigated for himself the cultivation of the beet and the minutia of manufacture, being afforded every facility compatible with the rules of the association of manufacturers.—He fully decided to make the experiment on a scale which should thoroughly prove the matter in this country. Having previously travelled over nearly all the States of the Union making himself familiar with the soils of the country, he decided to locate in Illinois. After having spent some time in examining locations, so as to secure suitable land, cheap fuel, &c., he made choice of a location at Chatsworth, Livingston county, situated on the line of the Peoria and Oquawka Railroad, between the main line and Chicago branch of the Illinois Central Railroad, about one hundred miles distant by rail from Chicago. Contracting for two sections of land, the brothers at once com-

menced to prepare for a crop of beets, and to erect a factory. Knowing the importance of a thorough preparation of the ground, they at once procured the necessary plows and teams to turn up and pulverize the ground to the depth of *one foot*, not eleven inches—it was mostly done by the Michigan double plow; a part of it was plowed last fall, and a part in the spring. About one hundred acres were prepared at a very heavy expense.

The seed planted was imported by them from the most reliable sources, and planted, some of it being dibbled in, others sowed in drills, and notwithstanding the excessive drouth and the unfavorable weather of the spring, which delayed the planting of it until quite late, the excessive drought of the summer and the early frosts, they have now on the ground a crop which will yield in quantity as much as the average of the best fields in Europe. As to the quality in saccharine properties an analysis of them made last week by Mr. Bender, of this city, shows 12½ per cent. of dry allizable cane sugar, and 3½ per cent. of other soluble impurities—of which, at least eight or nine per cent. of sugar should be extracted, at which rate the yield of it would be from 2,500 to 3,000 lbs. per acre.

The crop is now being harvested and pitted preparatory to commencing the manufacture.

The building occupies a ground space of 150 by 100 feet, and the tower and main part a height of 50 feet, the whole being constructed in the most thorough and substantial manner; the supporters of each floor are entirely independent of the main frame of the building, and each floor independent of the others, so that in case of overloading any one, the building has no strain.

The machinery is driven by two engines, a large and powerful one for driving the graters, centrifugals, washers, &c., a smaller one for the pumps and vacuum pan. The whole establishment has been erected without regard to expense, in the very best and most substantial manner. The machinery for grating and swinging out the juice has been imported from Germany, and is the best improved in use there, and we cannot doubt that abundant success will crown the labors of Messrs. Gennert Brothers—who have been the first in the Union who were willing to risk so large a sum of money as was necessary (about \$50,000) to make the experiment. That such may be the result, and our own Prairie State have the honor of the inauguration of it, is the sincere wish of all who have watched the energy and perseverance of Mr. G., who has met with many obstacles and difficulties which would have discouraged almost any other man.

FARM OPERATIONS.

WORK TO BE DONE.

Implements.

If you have not a subsoil plow, a carrot-weeder, and a good horse-hoe, buy them at once; they will more than pay for their cost during the coming season. Repair and paint implements, and store up such as are not required for immediate use.

Firewood.

If your wood shed has not been filled during the summer or fall, do it now, with a two years' supply; this enables the wood to become seasoned before use, and well seasoned wood is more economical than any other.

Manures.

Look well to compost heaps. We should remember that there is no winter in a compost heap, and it may *fire-fang* even in the coldest weather. Return the drainage to the top of the heap frequently. If this is done with regularity, it will save the greater labor of turning it over.

Ice Houses.

Before ice-houses are filled they should be put in perfect repair; the slightest opening suffered to remain in the walls will cause the ice to be wasted. In former times, hay, charcoal, or other filling, was placed between the double walls of the houses, to insure warmth and prevent the circulation of air; but it is now well established that, as confined air is the great non-conductor of heat, it is better to use no filling between the walls, but to have them thoroughly air-tight, and painted, if possible, on the inner sides with some cheap paint.—*Working Farmer.*

AN EXPERIMENT IN MANURING FOR WHEAT.

IN preparing my ground for wheat in the fall of 1862, I tried an experiment in manuring which I will relate for the benefit of those whom it may concern. The ground was a fallow and a gravelly soil—a large part was

manured by top-dressing with well-rotted manure after the last plowing; about two acres was manured before the last plowing, the manure being plowed in. Then all was harrowed before sowing, and the wheat was drilled in at the rate of $1\frac{1}{2}$ bu-hels per acre. The result was that where the manure was plowed in the wheat was decidedly the best, so much so that one of my neighbors who cut it for me with one of Kirby's reaping machines, said it was the stoutest wheat he had worked in during the season.

I think the result was not such as writers on the subject generally expect, as top-dressing wheat seems to be the advice given by most persons when it refers to raising wheat. I am willing to say that such a result was not anticipated by me at the time; if it had been, I should have managed differently, as I manured only about one-quarter of the piece in that way. The ground being light and warm, it was not rolled into the bottom of the furrow and covered deep, but merely rolled between the furrows, so that when harrowed in, it was not very deeply covered, but probably better mixed with the soil than when it was harrowed only.

Now I wish to know if such results are common with farmers on such soils, or is this an accidental occurrence, which would not be likely to occur again under the same mode of treatment. From what I have observed in this experiment I should prefer to manure before the last plowing, so that with the plow and harrow both it would be better mixed with the surface soil than it would by the harrow alone, thereby getting a better crop in return, especially on a light gravelly soil. How it might prove in a clay soil I do not know; perhaps the result might be different. The early part of last win or was unusually hard on wheat, as the ground was frozen hard, with little or no snow, and when snow came the wheat on the ground looked unusually brown and withered.—J. TALCOT in *Country Gentlemen*.

TRENCHING.



HE ordinary preparation of the soil for field crops, as performed by most farmers, is not sufficient for the successful and profitable cultivation of the garden and the orchard. In former years, cultivation, as generally practiced in this country, was of the most superficial character. It was not until the European gardeners and vine-growers settled among us that a better system of culture was introduced.

Our most observing farmers and gardeners, seeing the great benefits resulting from a systematic deepening of the soil, have adopted it to a considerable extent, with the most gratifying results. No good cultivator now expects the most profitable returns from the market garden, orchard or vineyard, without trenching or trench plowing the soil.

In our country we are very subject to summer droughts, and as we advance westward, owing to causes that are easily understood, this evil increases. To a considerable degree, the deepening of the soil averts the effects of drought; and in retentive soils trenching greatly facilitates the drainage of the excessive moisture. These alone are important considerations, yet they constitute but a part of the advantages of a deep, well prepared soil. The root plants seldom extend much below the surface that has been broken and disintegrated by the plow; hence they are exposed to extreme and sudden changes. A soil that is worked and thoroughly pulverized to a depth of twenty inches, affords more than double the *pasturage* to the roots of growing crops, that a soil does that is only broken up to the depth of ten inches. A deep well pulverized soil too, admits of circulation of air to the roots of growing crops, which is essential, and the amount of moisture that is thereby condensed and added to the soil, in a dry season contributes in no small degree to the vigorous and healthy growth of the crops.

The experiments of Jethro Tull, more than a hundred years ago, and more recently practiced by the Rev. Mr. Smith of Lois Wedon, have contributed greatly to the knowledge of the proper system of cultivation; although their experiments were confined more to a system of surface tillage, by which the particles of soil are constantly changed, securing thorough disintegration and aeration. Added to this the deepening of the soil in our climate, we arrive in that line to the perfection of cultivation.

Trenching is either accomplished with the spade or the trench plow. With the spade the work can be most thoroughly done, though at somewhat greater cost; yet the most successful vine growers in the West prefer to trench in that way. To trench an acre of ordinary loamy soil three feet deep, as some practice, it will cost from \$70 to \$100, and at the present price of labor perhaps something more. At this cost many would be deterred, although for many kinds of fruit it would prove in a few crops a pro-

fitable investment. A cheaper method, and one that will answer a tolerable purpose, and pulverize the soil to the depth of twenty inches or two feet, the plow may be used to accomplish more than half of the work. To do this a strong, deep running plow is necessary, with a steady, heavy team of oxen or horses. Two furrows must follow in the same direction, and in the same track, the team returning without taking a furrow. In plowing the second furrow the clevis must be adjusted in order to increase the depth to the greatest possible extent. The spade is now used to throw up the loose earth, requiring several men to accomplish it, without delaying the team. Then a second furrow is turned into the open trench, and then another turned from the bottom of this, as in the first instance, and the loose earth thrown out, and this operation is repeated until the whole is finished. The same work can be accomplished with greater facility with two teams, one following in the track of the other. In a good soil a double or trench plow may be used to advantage, something of the style of the plow formerly known as the Michigan double plow. But for deep trenching for garden or orchard purpose, this plow may be improved so as to run considerably deeper than the ordinary plow known under that name.

In trenching, whether with the spade or the plow, or with both combined, the object is to invert the soil, and to place the top furrow at the bottom of the trench, and to bring the bottom soil, or subsoil to the top. The mode of doing this has been so frequently described that it is not necessary to repeat it here. After throwing eight, ten, or more inches of the subsoil to the surface, a considerable amount of enriching material must be added to the surface, and worked in and thoroughly incorporated with the poorer soil now at the top. For this, well decomposed manure of almost any kind will answer, but that composed of stable manure, muck, leaf-mold or decayed turf thoroughly mixed and well rotted, is the best.

Those who have not witnessed the effects of this mode of preparing the soil, can form no idea of the perfection to which the pear, apple, grapes and garden crops generally, can be produced, compared with such as are attempted to be grown in the ordinary way. —*Country Gentleman.*

ASHES FOR SANDY LANDS.

Of all the manures within reach of the farmer, I consider ashes the cheapest and

most durable for sandy soils. For clover on sandy land, it has no equal among all the manures and fertilizers of the day. The soil in this vicinity is a loose, sandy soil; in fact, we have, as it were, a prairie or sand plain, such as were found in nearly every portion of our county fifteen years ago. They appear never to have been charged with vegetable matter, for even when the timber is first removed, and the land cleared, and put to rye and other crops, they yield liberally only for one or two years before they require generous manuring. It is loose, porous, and without that firmness which is requisite to keep plants in their places, even if their proper food could be found. This land, a few years ago, could have been bought for one-third what it would bring at the present time. The cause of this rise in the price of land is a liberal supply of muck and ashes. The muck is drawn on in winter and spread over the land; the ashes are applied in the spring, at the rate of 75 bushels to the acre; after corn is planted it is put on the hill or sown broadcast. The general rule is to plant with corn and put the ashes on the hill; sow to rye in the fall as soon as the corn is removed, seed with clover the following spring. The following season, after the rye is removed, the seed is gathered from the clover and the straw left standing on the ground. This is done with one of Disbree's Clover Strippers, an excellent machine for the purpose. Two bushels of seed are frequently obtained from an acre; the straw thus left standing forms an excellent substance, in connection with the muck, to fill the pores or open places between the particles of sand, and supply proper food when acted upon by the salts around it. I have known portions of these plains the surface of which, to all appearance, had not been covered with vegetation within the memory of man—where the blackberry vines grew weak and feeble, and five finger vines grew weak and far between, so completely invigorated and enriched in a few years, as to produce thirty bushels of rye, or two bushels of clover seed to the acre. Those lands thus brought to a state of fertility, are capable of yielding as good a crop every year, under the application of ashes, as those lands which have never been reduced. The owners of farms of heavy loam have heretofore considered these lands of little value, as compared with theirs; but I would sooner cultivate a corn crop on them than on the heavier loam

land, I can work two acres of the sand as well as one of the heavier land, because the plowing and hoeing can be done with less team and help, and in much less time. Ashes here can be bought for 12½ cents per bushel, and I think are worth 25 cents to be applied to sandy soil in connection with muck. This mode of operation for the treatment of sandy soil, so as to bring it on an equal footing in point of productiveness, requires no uncommon skill, but commends itself to the practice of all—for any common manager of a farm may accomplish it without the aid of any adjuncts of chemistry, or what are called special manures, but by using merely those great gifts of nature.—S. P. KEATOR, in *Country Gentleman*.

A PROFITABLE CORN CROP—HOW RAISED, &c.

THE best corn with us (southern Herkimer county,) is raised on sod. This was not always the practice; and now and then a farmer turns down stubble either of grain or corn, for corn. But the best cultivators, and the great majority, plant upon sod. This, a thorough experience has demonstrated, is the best practice.

And now let me give you a particular instance of successful corn-raising,—not only successful in the amount of bushels, but profit on the whole crop, labor and all considered. Farmers want not only great crops; they want profitable crops. And here is one.

Moses Smith, a neighbor of mine, last spring turned in nine acres of sward. The sward had been meadow for twelve years. It was plowed eight inches in depth. This was done to secure mellow top soil; as well as new fertility from below. Another thing: The sod turned in deep, the worms are kept below, working in the sod till the corn has a good start. That is the theory, and it seems a successful one.

This sod was plowed in a few days with several teams, and finished in the middle of May. The weather was favorable, and the ground in good order. Immediately after the plow left, the corn was planted. Before it came up, a handful of hen manure (dry) mixed with a little plaster and wood ashes was applied to each hill. This was done, says Mr. Smith, to prevent the insects from hurting the corn, and to give it an early start. It came up rapidly and "black." It grew on at once. Moist

warm weather setting in, the cultivator was called into requisition, and, during the summer, was passed six times through the rows each way, the rows being four feet apart. The hoe was used around the hill to cut away the grass, and in such manner as to draw away some of the ground, so as to give the sun a more direct chance at the roots.

Thus the soil was kept clean with comparatively little labor, the weeds not being very abundant on the deep turned down soil. It was what may be called a clean crop. It was certainly a very clean soil, and an even piece of corn, showing good promise at once and throughout, and the best crop of corn, the evenest and the finest, all things considered, I ever saw. The soil was thoroughly mellow, a deep, rich, black loam, with good natural drainage in the sand and gravel mixed with it, except at the upper end, where water had always been standing more or less during the greater part of the season, from time immemorial. Through this a ditch was run, I believe the fall previous. To my surprise, and every body else's, the corn was equally good here. But the soil was as mellow as the rest, and equally rich and black, with, I believe, a little marl mixed with it.

There were from four to six stalks—averaging five—in a hill. Each stalk had from two to three large ears Dutton corn, "medium size."

The corn was cut in the first half of September; begun on the first and finished on the twelfth day of the month. It had been well glazed, but no more, when cutting was commenced.

I should have mentioned that several acres of the lot had been in corn the year before, on sod turned down. This corn was equally good with the rest: and here the cutting was commenced, perhaps on account of the corn being riper, though of this I am not certain. The corn here last year was excellent, but lacked a few bushels to the acre of the crop of the present season, which was more favorable to corn, especially on sod, but more especially sod turned in deep.

The yield of the nine acres averaged a trifle over eighty bushels to the acre. The corn was unsurpassed in quality, the grain hard, plump and glistening—and it was all like this, with the most trifling exception.

The stalks, by being cut early, when yet fully green, the husk of the ear being only changed somewhat, afford the best and sweet-

est of fodder, having this advantage over hay say our farmers, that it makes yellow, as well as better flavored butter, and is preferred to any hay. The stalks are fed the fore part of winter, and much butter is thus made, which always sells for the highest price. Besides, cows are said to give milk longer, and thus get up a habit in this direction. Thus the stalks will pay all expense, and leave the corn a clear profit of *ninety dollars the acre*.

Mr. Smith's father, a few years since, raised 1,500 bushels of hard ripe corn, for which he got a dollar a bushel, from twenty acres of similar land, the farms joining. This is about the average yield, taking the years as they run. Sometimes but 60 to the acre is realized, and by some slovenly farmers even less. But the great depth of soil, its richness and thorough (natural) drainage, its uniform mellowness and blackness drawing the rays of the sun—and the hills on either side of the valley, running east and west, thus warding off the winds, and giving a direct chance to the sun,—all these things have their effect in producing in this valley the corn that is raised. But corn is raised successfully in the same manner on the hills and throughout this section generally, varying in profit with the nature of the soil.

The two successful crops of the valley are corn and hops, making fortunes for their proprietors; and they are usually grown on the same farm, and generally in addition to a dairy. The three are usually found together, the dairy enriching the soil (by pasturage and the manure that is made,) the cornstalks supplying fodder, and the corn ground preparing the land for seeding, which generally here follows the next crop, either of oats, wheat or barley, the latter two being preferable for seeding.

The principle of planting corn on green sward is held to be this: The mellow soil or top is favorable to tillage, and free (if plowed deep) from insects, as we have said; and by the time the roots penetrate well the sward—which occurs at the commencement of the hot weather in July—decomposition will have set in, which *warms the under soil* as well as enriches it, and thus drives on the corn. This is the principle held here. At any rate, corn is a success on greensward, turned down in the spring. Now and then fall-plowing has a good effect, or has had, as little is done now. But it seems the sod turned down gets soaked during the winter, unless the drainage is

perfect, which is far from being the case generally. This, by the time the corn is planted, seems to sour, and if turned up with the plow is often found to be wet. Especially late (fall) plowing seems to have this effect, probably by packing the soft wet soil. In clay we know this to be the case, even if the soil is but slightly mixed with it. One of the greatest injuries to soil, whether plowed in fall or spring, is to plow it wet. This is the case with our soil, as I have often enough witnessed. I find there is little difference whether the soil is black or yellow, rich or otherwise, though gravel or sand is less objectionable than clay. Last fall our neighbor Hall plowed his garden late and very wet. Though the soil is a very rich, black, mellow soil, highly productive, we prophesied a failure the next season; and it turned out so, eminently. I have lost entire crops in this way, one, a barley crop on good ground, by harrowing it when wet, and but once at that. The ground was bare, and finely harsh, almost a miracle to look at in its consequences.

On the whole then, spring plowing for corn on sod, is preferred, and is always a success if the corn is well taken care of, in this locality, especially in the valley. And why not so in other places? We think Mr. Smith has hit upon the right management, and it is his second year of farming; he is a young farmer, and reads, and thinks, and labors—labors *himself*.

I should have mentioned that no manure is used, the sod being considered sufficient manure. This is applied on grass lands as a top-dressing here with the best of success—though none that I am aware of, and I am pretty certain in this—was ever used on Mr. Smith's meadow, the soil being rich and always yielding well without manure.—F. G. in *Country Gentleman*.

VALUE OF LEACHED ASHES.

IN conversation with an agricultural friend, sometime since, he mentioned that he had found great benefit from the application of old leached ashes to wheat, especially on sandy soils. In one instance, one hundred bushels of ashes per acre, spread on the soil after the wheat was sown, gave him an increase of ten bushels per acre. He has spots on his farm where he can see the beneficial effect of unleached ashes, applied nine years ago. Every time the lot is sown with wheat. He has tried unleached ashes with no benefit to wheat, though he thinks them good for corn.

To what is the fertilizing property of old leached ashes owing? We cannot definitely answer this question. We are inclined to think, however, that it is owing in some way to a substitution of the alkali ammonia for the potash and soda, which have been leached out. It may be that they contain the double salt of silicate of alumina and soda, to which clay owes its power of retaining ammonia. If this is the case, by adding leached ashes to a sandy soil, we add ammonia, or at least, the means of retaining the ammonia brought to the soil by rain from the atmosphere; and that, too, in the best condition for assimilation by the plant. Taking this view, it would follow that the older the ashes, and the more they had been exposed to rain, the better and stronger they would be for manure.

But whatever difference of opinion there may be as to the cause of reason of the fertilizing value of leached ashes, all agree that they are valuable for wheat on sandy soils.

There are in many parts of the country old asheries, from whence leached ashes can be obtained at a mere nominal price; and it is truly surprising that they are not more extensively used. The fall is the best time to apply them, though they might be spread on the wheat, while more or less snow is on the ground in the winter, to advantage.—*Harris's Rural Annual.*

DEEP PLOWING.



HERE is no subject in agriculture more worthy of consideration, than that of plowing deep in the fall, under certain circumstances. My experience on this subject has shown me, that clayey and slate soils may be greatly benefited by plowing deep in the fall, exposing the soil to the action of the air and frost during the winter.—Experience has also taught me, that plowing clayey, soils deep in the spring, so as to turn up two or three inches of soil never before exposed to air, is sure to be a failure in the first crop.

After being thus exposed for one year to the atmosphere, and plowed the following spring, the increase in the next crop will be plainly seen, proving the advantage of plowing such lands deep in the fall. On slaty soils I have seen far greater results from this method.

A portion of my farm is slate. I was told by some of my neighbors that a part of this slate has been under the plow for over twenty years. He also told them he

had tried a number of times to seed it, but without success. I commenced plowing this piece of land with the intention of restoring it to fertility. I plowed it beam deep, and sowed oats in the spring, and seeded to June clover. The result was more than I expected. A uniform growth of oats, three feet high, was the result. The next June I mowed one and a half tons per acre of good clover hay upon said land. In September following, there was a greater growth of clover than in June, I commenced plowing in the clover on the 15th of September, and sowed to winter heat. The July following I harvested a fair crop of wheat, considering the amount of insects which worked upon it. I plowed again in the fall, and sowed oats in the spring expecting that there would be clover seed enough left to seed it; but in this I was disappointed; the result was a fair crop of oats for this year; I have plowed again this fall with the intention of seeding next spring.

Another piece of land adjoining I plowed in the fall, and sowed with oats in the spring. I harvested what the insects left after doing their work, which was 45 bushels per acre. Said piece of land did not produce more than 40 bushels of ears of corn per acre the year before. I have satisfied myself that there must be some power in slate stone for the growth of vegetation, when brought into a state to be acted upon by the roots of plants, which is done by the action of heat and cold, in pulverizing the slate.

Geology and experience have taught us that no soil, unless exposed to the atmosphere, will vegetate the least plant. We may take swamp muck, as an example, which experience teaches will be of no use until brought to the air, and changed by a chemical process in uniting with some other substance, or the action of the atmosphere upon it, thus changing it into a valuable manure.

In the other case, the soil is not so much saturated with water, as in the former, and nature is, in this case, her own remedy, when the soil is exposed to the atmosphere. The distance to which air penetrates clayey soils cannot be more than two or three inches when plowed shallow. While with deep plowing it may penetrate to three times that depth.

Experience has taught me that upon fine loam or gravelly lands, the soil is far more porous than in clayey lands, and if plowed

in the fall, the strength of the soil will leach down during the late rains in the fall and early spring and disappear, giving to the owner no profit, and making the land poor faster than the farmer will be able to

feed it. This is a day and age of improvement, and perhaps time and experience may develop much more than has now come to light.


MILTON R. DUNHAM.

Spring Brook, Dec. 12th, 1863.

BREEDERS' DEPARTMENT.

WORK TO BE DONE

Stock.



T this season particular attention is requisite for the care of the live stock, in order that it may be carried through the winter in first-rate condition, and with the least possible expense to the farmer, consistent with the well-being of his cattle. Cut all the food consumed by the stock, and if the machine used is not capable of cutting less than an inch in length, buy a new one. If cornstalks be cut, steam them before use. Corn should always be ground, and if scalded before admixture with cut or chaffed hay, or cornstalks, it will be found to be an economical practice. Oats should at least be bruised, if not ground, before use. Cut or pulp roots before feeding them, and provide pure water for cows. Those who have carrots would do well to feed half carrots and half oats to horses, in preference to oats alone; and in a change of roots for cows, the carrot will be found of great value, as it improves the quality of the milk. Do not suffer water to be exposed in cold weather for a long time before it is drank by the cattle. It should be freshly drawn from the cistern or well at the time of use, so as not to uselessly reduce the temperature of their stomachs. If any is left over in the trough or drinking vessel, throw it away unless the weather be mild. Attend well to cows which have calved or are about to calve.

Stall-feeding.

Cattle in the stalls should be by this time so well accustomed to house feeding as to be on full keep; their houses should be kept moderately warm, well ventilated, and scrupulously clean, and the cattle well curried and wisped down every day: and if the long hair on their tails and other parts has not been sheared off before now, it should no longer be delayed. If scurf or itchiness in the skin appears, wash with a strong solution of salt and water; and in cases of hoove, the best remedy is to dissolve two or three ounces of gunpowder in

a pint of new milk, and drench the animal with it, which will speedily disengage the pent-up fetid gas, and give relief, acting also as a purgative. Ill doers should be disposed of, as there is nothing to be gained by keeping them over.

Milch Cows

Should be kept housed, with the exception of an hour each day at noon for exercise. Keep their houses clean and comfortable, and feed generously, otherwise they will go back in milk and condition. Alternate feeds of cooked and raw food will keep them in high condition, and provoke a plentiful secretion of rich milk. Brewers' and distillers' grains and wash, with swedes and mangels, and plenty of good hay, and three or four pounds of rape cake, make excellent keep in such cases.

Young Stock

Should be well and comfortably housed, and liberally fed with nourishing food; growing animals requiring as much or more than those full grown, to render them profitable to their owners. It is now an established fact that there is no profit in half starving young animals, and that the full and nutritious feeding of animals from their birth considerably shortens the period of bringing them to maturity.

Sheep.

It is much to be regretted that stock masters in this country do not provide comfortable shelter for their flocks of sheep; shelter and sufficiency of food is as fully remunerative with sheep as with any other description of stock. Animals cannot thrive so fast on the best of food without sufficient shelter and warmth as with it. We would strongly recommend this subject to the consideration of our farmers. The farmer with his one cow and couple of sheep, driven in and out with the cow, finds an advantage in the shelter thus given, in both wool and carcase. When the practice is good and remunerative on the small scale, it must be much more so on the large one. When well littered, the quantity of rich manure turned out makes a vast addition to the manure heap.

Hog Pen.

Keep a sufficient quantity of dry bedding in the hog house, and in cold weather give warm feed. Pigs should henceforth have warm, comfortable sties, and an abundant supply of nutritious food. Cooked potatoes, turnips, mangels, cabbages, parsnips, and carrots, with a liberal allowance of meal and bran, will well pay in feeding this species of stock.

Heneries.

Attend to the condition of heneries. Those who have no henneries, should at least provide a suitable shelter for their poultry. Hens should never be allowed to roost in trees.

COOKED FOOD AND CHAFF AS CAUSES OF THICK AND BROKEN WIND IN HORSES.



ANY farmers have given up the steaming or cooking of food for their horses from the conviction that such a system gives rise to thick and broken wind. They point to the lesser proportion of such cases which occurred in their stables before the cooking system was in use, or since it has been abandoned. The facts and figures appear to be so strongly supported by trustworthy evidence that they cannot be gainsaid. A Forfarshire gentleman farming upwards of 500 acres, informs me that he found on an average that the wind of at least one horse was sacrificed every winter so long as he continued to give cooked food, and that he has not had a single case during the three years he has discontinued it. In Berwickshire we find like complaints. One owner of twenty horses in that highly farmed county states, that during the space of two winters one-fourth of his horses previously sound, became damaged in their wind, owing, he believes, to the use of cooked food. The high temperature at which such food is often given is, we find, generally regarded as a cause of the mischief; but it has, we think, little to do with it.

Cooked food is not, we believe, *specially* liable to injure the wind of horses. It is not a bit more likely to do harm than the pulped roots and chaff sometimes substituted for it. Indeed in reasonable quantity it may be given to horses intended for slow work, not only with impunity, but with advantage. The mischief results not so much from the use as from the abuse of the food. It depends not upon the cooking or the warmth of the mess, but on its being given

in unduly large quantity. Usually made palatable and savoury, and being besides of a soft consistence, it is greedily and rapidly eaten, and the horse thus readily overloads his stomach. Such habitual overloading of the small stomach of the horse gradually induces, as is well known, thick and broken wind. Disorders of the digestive organs thus implicate the lungs, owing, it is believed, to both being abundantly supplied by the same nerves. In physiological language, it is a case of disordered reflex action. The stomach and bowels at first deranged, transmit to the spinal chord and nervous centres morbid impressions, which are thence diverted to the lungs, gradually disturbing in a way not as yet explained, their delicate functions. Free respiration is interfered with; the breathing becomes difficult and easily quickened; an easily excited short unsatisfactory sort of cough appears, and the animal exhibits less capacity for fast or severe exertion. The early symptoms connected with the digestive disturbance become aggravated, and the horse becomes more pot-bellied and flatulent, and more liable to indigestion.

In many of the midland and southern countries of England these chronic diseases of the air passages are extremely common amongst farm-horses, and are directly traceable to faulty feeding. The English horses although seldom injured from the devouring of cooked food, suffer in precisely the same way from being inordinately crammed with bulky chaff. On many English farms the horses which are usually worked four or five together, in a long stretch or team, turn out for work about seven, and remain unfed in the field until two, or occasionally three o'clock in the afternoon. On their return to the stable they are diligently fed or "baited," as it is popularly styled, by the carter and boys, receiving either corn chaff and cavings, or hay and straw mixed and cut into chaff. Only a handful or two is given at a time, and mixed with it a very minute proportion of corn. For four or five hours this tedious baiting continues, and the men only leave the stables between seven and eight o'clock, when the horses are suppered-up, usually with straw, or in more liberal establishments with hay. Before five in the morning the careful carter is again laboriously waiting on his team, and the baiting is repeated as before, until the animals turn out to work. Under this regimen the horses look as pot-bellied as mares about to

foal. They seldom show much condition or pluck, stand heavy work indifferently, have frequent attacks of colic, and seldom reach six or eight years of age, or do much hard work without becoming hopelessly damaged in their wind. The injudiciously protracted fasts doubtless contribute to this, by weakening the tone of the digestive organs, and rendering besides the horses ravenously hungry, and disposed to gorge themselves whenever food is presented to them. But the quantities of dry choking readily swallowed chaff, with which the modicum of corn is so largely mixed, also prove very injurious. They unnaturally distend the small stomach; for their sufficient moistening they require a large amount of secretion, and being hard, indigestible, and not very nutritive, they are reduced and assimilated with difficulty. Hence then their liability to induce gastric derangement, which by-and-by, as already stated, involves the lungs also.

The horse is naturally a herbivorous animal. On his native plains grasses constitute his chief food. They are leisurely torn up, carefully chewed, and freely mixed with saliva. He is unaccustomed to abstinence, and his meals follow each other at short intervals. As the willing servant of man his condition and management undergo serious changes. He must eat heartily of his morning repast, for five or six hours elapse until he is again fed; and in England many farm horses go unfed for eight hours. Such fasts become especially pregnant with evil when the food is coarse, bulky, and deficient in nutriment. Adequately to supply the wants of the system the animal then requires to devour enormous quantities of the poor and unsuitable fare. We have known many a wretched underfed animal, too tired or sick to eat, turn instinctively to the rack or manger whenever its collar was produced, as if it realized the dire necessity of preparing for prolonged abstinence.

We may remark in conclusion that cooked food and chaff may be used for farm horses with perfect safety, and indeed with advantage provided they are given in moderation. From 14 lbs. to 20 lbs. of cooked food, or of pulped roots and chaff will be an ample daily allowance. Such food ought to be given at night rather than in the morning; and being bulky and not very nutritive should never be used immediately before work. Along with the corn several handfuls of chaff prove a valuable addition, for it ensures more thorough mastication,

and diminishes the chances of the corn being wasted. A further quantity of cut food may also be given, and is best employed slightly damped; but at least one-half of the total quantity of fodder should be used whole.—*North British Agriculturist.*

FATTENING SHEEP IN WINTER.

THE present ordinary mode of fattening sheep in winter in New York is thus described in a letter from John Johnson, Esq., of Geneva, New York, who is one of the oldest and most experienced feeders, as well as grain farmers in the United States.

"I generally buy my sheep in October. Then I have good pasture to put them on, and they gain a good deal before winter sets in. I have generally had to put them in the yards about the first of December. For the last twenty-three years I have fed straw the first two or two and a half months, a pound of oil cake, meal, or grain, to each sheep. When I commence feeding hay, if it is good early cut clover, I generally reduce the quantity of meal or grain one-half; but that depends on the condition of the sheep. If they are not pretty fat, I continue the full feed of meal or grain with their clover, and on both they fatten wonderfully fast. This year (1862-3) I fed buckwheat, a pound to each per day, half in the morning and half at 4 o'clock, p. m., with wheat and barley straw. I found the sheep gained a little over a pound each per week. It never was profitable for me to commence fattening lean sheep or very fat ones. Sheep should be tolerably fair mutton when yarded. I keep their yards and sheds thoroughly littered with straw.

"Last year I only fed straw one month. The sheep were fed a pound of buckwheat each. From the 20th of October to the 1st of March, they gained nearly one and one-eighth pound each per week. They were full-blood Merinos—but not those with the large *cravats* around their necks. I have fed sheep for the eastern markets for more than thirty years, and I always made a profit on them, except in 1841-2. I then fed at a loss. It was a tight squeeze in 1860-1 to get their dung for profit. Some years I have made largely. I did so this year (1862-3), and if I had held on two weeks longer I should have made much more. Taking altogether it has been a good business for me."

Mr. Johnson, by underdraining and by the manure obtained by fattening sheep,

has almost created one of the finest farms in New York.—*Practical Shepherd.*

USE OF SALT IN THE FOOD OF CATTLE.



THE following are extracts from a recent prize essay on common salt, by Dr. Phipson, of England:

“The use of salt in the food of cattle must not be looked upon as a direct producer of flesh, so much as a necessary element of the economy, without which animals are apt to perish from disease, but with which the body is kept in a normal and healthy state. Not many years ago a German agriculturist, Uberacker, brought forward an experiment which is in direct accordance with this opinion. Wishing to obtain some exact notion of the influence which salt exercised upon his sheep, the flocks of which lived upon a low damp, pasture-land, and received habitually a certain dose of salt, he fixed upon ten sheep, and struck off their usual allowance of salt.— This remarkable experiment was continued for ten years, with the following results: In the first year five of the ten died of rot and worms; in this year the remainder of the flock, 450 head, lost only four sheep. The second year, a new lot of ten sheep, deprived of salt, lost seven individuals, the remainder of the flock, 364 head, lost five only; a little later, the other three died also from diarrhæa. The third year was very rainy. Sixteen sheep were selected, and deprived of salt. The whole of them died in the course of the year, of the rot and vermicular pneumonia.

“In the Brazils and Colombia, flocks may be annihilated by being deprived of salt. M. Garriott, member of the Agricultural Society of Lyons, assures us that the milk of cows subjected to a daily allowance of salt is richer in butter and cheese than when these same cows are deprived of salt.

“Sir John Sinclair, to whom agriculture owes much useful information, has observed that the habitual use of salt has a marked influence in improving the quantity and the quality of the wool of sheep.

“Many English agriculturists have proved, by direct experiments, that a regular distribution of salt to cattle is especially useful in preventing hoove (meteorization) caused by feeding cattle with leguminous vegetables. And there exists doubt among those who have it, that when employed in proper quantity it increases the appetite, stimulates digestion, keeps up the normal

supply of salt in the blood, improves the wool or hair of the cattle, prevents disease, and moreover, enables the agriculturist to fatten cattle upon food which they would not enjoy without it were previously mixed up with salt.

“But there is another important consideration with regard to the regular distribution of salt to cattle; namely, its influence in preventing disease. Its daily use becomes of serious consequence when flocks and herds are menaced with those epidemic attacks which too frequently ravage a whole country at once, when a proper use of salt would either prevent them entirely, or at least reduce them to less disastrous proportions. During one of these epidemics, which sprang up about the year 1840, in the East of Europe, the almost wild cattle of the Ukraine, Podolia and Hungary, were struck down in much greater numbers than those of Silesia and Bohemia, where the cattle-breeders habitually distribute salt to their beasts. Advancing towards the West, this scourge diminished in intensity, and finally ceased to show itself in Germany where particular attention is bestowed upon cattle, and where salt has been for many years constantly employed.

“In Great Britain, in the best farmed districts, we find the allowance of salt oscillating around the subjoined figures, take as a centre of basis:

Allowance of salt per diem.	
Calf six months old	1 ounce.
Bullock or cow, one year old.	3 “
Oxen, fattening	6 “
Milch cow	4 “

Horses.

It is generally admitted, wherever salt forms habitually a portion of the horse's diet, that this animal repays the slight additional expense or trouble thus incurred.

To mix salt with the food of the horse, colt, ass or mule, is a frequent practice in England and America. In these countries the usual allowance for a full grown horse of middle height, is about two ounces per diem. In Belgium, the quantity of salt appropriated to a full grown horse by the government is little more than one ounce per diem.

Sheep.

“The Romans gave to their flocks of sheep, every fifth day, an allowance of salt amounting to about half an ounce per head, and this is precisely the quantity which is still employed in England and Saxony daily, for sheep full-grown and of ordinary

size. Numerous experiments have proved that salt is more beneficial to sheep than to any species of cattle.

Pigs.

"The best proportion to adopt as a basis appears to be about two-thirds of an ounce per diem for full grown pigs.

"In administering salt, unless it be used as medicine, the more intimately it is mixed with the food, the better. This is not an easy matter with fodder, especially that which has been salted to preserve it, in which case we must endeavor to make a rough estimate of the amount of salt in a given weight of fodder, in order not to administer an injurious excess. In farms where oil or rape cake is given in powder, this being rather an indigestible food, the allowance of salt should be mixed with it in preference to any other fodder.

"It should be borne in mind that an excess of salt is injurious to any animal; and that is why the preceding figures are given as a kind of practical guide. An excess of salt produces irritation and inflammation of the mucous membrane, and causes several kinds of skin diseases, especially in sheep. With horses an excess of salt has been known to produce dysentery; and in oxen diseases of the blood. Salt should never be given to cattle when a deficiency of food does not enable them to receive abundance of nourishment; in which case we excite appetite without satisfying it, and the animals lose flesh rapidly. Salt is to be prohibited, also, wherever congestion of important organs is observed, or where we have perceived inflammation of the bowels. In such cases we must not be guided by the instinct of the animals themselves.

"In some diseases of the digestive organs salt has proved beneficial. Thus, in cases of rot in the liver, accompanied by loss of appetite, paleness of the membrane swellings under the throat, avoid ground which communicates the rot, and give the sheep five grains of iodine and half an ounce of spirits of turpentine twice a day, and let them have free access to salt.—And again, for disease called "red water," a species of dropsy, give liberal supplies of food, a dry resting place and rock salt.

Considered as a medicine, salt purges animals at the following dose:

Horses.....	8 to 10 ounces.
Oxen.....	10 to 16 "
Sheep.....	2 to 3 "
Pigs.....	2 to 3 "
Dogs.....	1 to 2 "

It becomes poison at the following dose :	
Horses.....	2 pounds.
Oxen.....	3 "
Sheep.....	6 to 8 ounces.
Pigs.....	4 to 6 "

TIME OF GESTATION OF MR. J. R. BURNET'S COWS—1844 TO 1859.

The subjoined are carefully recorded observations of the periods of gestation in 66 cases of 13 cows, extending over a period of thirteen years:

1. **Dolly.**
 1846, 284 days, heifer.
 1847, 238 " bull.
 1848, 282 " heifer.
 1849, 296 " bull. (Sold.)
 2. **Molly.**
 1844, 285 days.
 1845, 285 " bull.
 1846, 291 " "
 1847, 291 " heifer. (Sold.)
 3. **Suky.**
 1844, 288 days, heifer.
 1845, 276 " "
 1846, 285 " bull.
 1847, 280 " " (Sold.)
 4. **Lilly.**
 1844, 287 days, heifer.
 1845, 285 " no sex given.
 1846, 284 " heifer.
 1847, 288 " bull.
 1848, 293 " heifer.
 1849, 295 " bull.
 1850, 290 " "
 1851, 288 " "
 1852, 292 " heifer.
 Last calf at 13 years old.
 5. **Jenny, large brindle cow.**
 1st calf at 3 years, 1847, 281 days, bull.
 2d " 4 " 1848, 281 " "
 3d " 5 " 1849, 286 " "
 4th " 6 " 1850, 283 " heifer.
 5th " 7 " 1851, 287 " bull.
 6th " 8 " 1852, 282 " heifer.
 7th " 9 " 1853, 284 " "
 8th " 10 " 1854, 284 " "
 9th " 11 " 1855, 288 " bull.
 10th " 12 " 1856, 289 " "
 11th " 13 " 1857, 282 " "
- Butchered. This cow is offspring of No. 4, Lilly.
6. **Sally, white cow.**
 1st calf at 3 years, 1848, 284 days, bull.
 2d " 4 " 1849, 290 " "
 3d " 5 " 1850, 292 " heifer.
 4th " 6 " 1851, unknown bull.
 5th " 7 " 1852, 278 days "
 6th " 8 " 1853, 279 " heifer.
 7th " 9 " 1854, 276 " bull.
 8th " 10 " 1855, 279 " heifer.

The following spring, this cow died before calving. Is offspring of Suky No. 3.

7. Polly, out of Molly. No 2—a mischievous black cow.

1st calf at 3 years,	1850,	unknown,	bull.
2d " 4 "	1851,	286 days,	"
3d " 5 "	1852,	280 "	heifer.
4th " 7 "	1854,	283 "	bull.
5th " 8 "	1855,	290 "	"

Butchered.

8. White-face, out of Dolly, No. 1.

1st calf at 2 years,	1850,	288 days,	heifer.
2d " 3 "	1851,	277 "	"
3d " 4 "	1852,	293 "	"
4th " 5 "	1853,	282 "	"
5th " 6 "	1854,	284 "	"

Sold.

9. Rose, brindle, born in 1851, from White-face. No. 8.

1st calf at 3 years,	1854,	262 days,	bull.
2d " 4 "	1855,	276 "	heifer.
3d " 5 "	1856,	281 "	"
4th " 6 "	1857,	284 "	"
5th " 7 "	1858,	276 "	bull.
6th " 8 "	1859,	287 "	"

10. Cherry, lean, red cow, 1853, from Sally. No. 6.

1st calf at 2 years,	1855,	274 days	heifer.
2d " 4 "	1858,	279 "	bull.
3d " 5 "	1858,	273 "	heifer.
4th " 6 "	1859,	279 "	bull.

11. Suky, yellow, 1855, from Sally, No. 6.

1st calf at 2 years,	1857,	275 days,	heifer.
2d " 3 "	1858,	279 "	lost.
3d " 4 "	1859,	281 "	bull.

12. White-face from Rose, No 9. 1854.

1st calf at 3 years, 1859, 285 days, heifer.

13. Sophy—mischievous red cow—bought at a vendue, at 4 years old, in 1856. Time with first 2 or 3 calves unknown.

4th calf at 7 years, 1859, 275 days, bull.

The time of gestation in 66 cases varies from—

273 to 293 days with a heifer calf.

276 to 296 with a bull calf.

From these tables it will be perceived that nothing like uniformity exists; the difference between the longest and shortest periods being twenty days, while, at the same time it will be observed, that there is considerable difference in the same individual at different gestations; this amounts in No. 1, to 14 days. These tables also show that, contrary to the popular opinion, the age of the cow has very little, if anything, to do with the length of the period of gestation, but that this depends rather upon the idiosyncrasy of the animal; some yielding a higher average, and some a lower.

Another fact deducible from these observations, is that the average length of gestation is longer by three days in bull calves than in heifers.—*Reporter.*

BREEDING HORSES.

SIN a late number of the Journal of the Royal Agricultural Society is an article on breeding horses from the pen of W. Dickenson.

Horses, he says, should be bred upon a dry subsoil to make them sound in constitution, sound in wind, and sound in color, by which he means that whatever be the horse's color, it should be a deep, not a faint one. The surface, moreover, should be fertile, abounding in carbonate and phosphate of lime, to grow horses of full size, with plenty of bone and muscle. Upon this subsoil and this surface, you may expect sound, full-sized, healthy animals. A wet, spongy, clay soil produces delicate constitutions, defective wind, pale colors, and large, flat feet.

He advises selecting mares for breeding when three years old. They are more free from defects, cost less, and breed better than when older. He very properly contends that none but the best mares should be selected.

Mr. D. says he formerly thought there were no better cart horses in the world than the English; but in 1855 he attended the International Exhibition in Paris, where he had sent some Shorthorn cattle. "There," he says, "my attention was attracted to a class of horses I had never seen before. I looked at them and was astonished, seeing them drawing great long carts, as long as the English wagons, loaded with immense blocks of stone (not as ours are loaded in London with two or three blocks), walking nimbly away the whole day from the pit to the building. These immense loads of stone made me think of the three or four dray-horses drawing at a much slower pace a few butts of beer through the London streets. These horses, walking so nimbly with these great loads of stone, were not so fat as our own favorites, but they seemed to be doing twice the work. Although leaner, they bore the strictest scrutiny; the more I saw of them the more I admired them. Meeting Mr. Jonas Webb, I called his attention to them. He said he had never seen such before; he had observed a horse taking into the show yard an immense load of provender for the cattle, that astonished him beyond measure; he had

resolved to try to buy him, but he lost sight of him that day and never saw him afterwards. I thought them so superior to ours, that I resolved to buy one to take home."

After considerable trouble he succeeded in finding one, called "Napoleon," and says:

"I have never once regretted the purchase. He has been worked on my farm ever since, almost always with mares. I have never had so good, quiet, active, and powerful a horse before. In no one instance has he given us any trouble. He is unlike our English cart-horses, for with great size, (sixteen and one-half hands high) and immense substance, he shows a dash of blood. He has an Arabian head, not small, but of fine character, well proportioned to his size. The neck is very muscular and well turned; the shoulders large, very deep, without lumps on the sides, and oblique, such in shape as would not be objected to for a riding horse. The bosom open, the fore legs magnificent and very short, with great bone, hard sinews, and with but little hair upon them. His feet are perfect in shape, and perfectly sound in work; his back short, rather dipped, round shaped ribs, large loins, rather plain drooping hind quarters, very large thighs, low down, and tightly joined together, with prodigiously powerful clean hocks, and very short hind legs, well under him. We never had a difficulty with the engine or thresher, or with anything in the mud that Nap. could not extricate us from. His stock are as good and kind as possible. It is a saying with the men that Nap.'s colts want no breaking. My mares are small and active; the stock are considerably larger than the dams, but so cleanly, that as foals they look more like carriage horses.


"I think the cart mares to work and breed should be of moderate size, from fifteen and one-half to sixteen hands. They should be long, low, wide, and handsome compactly made, with short backs, arching downwards, and with wide table shaped loin. The legs should be short and clean, the bone large, especially behind. They should be good walkers, and as I recommend working the mares on the farm, the high stepping action must not be overlooked.

"When the foals are weaned in the autumn, they must have shelter and be well kept. A few oats, cut roots, cut hay, and a little bran, will do well for them till they go to grass in the following summer, during


which time the colts must be castrated. In the winter they may again be kept in the sheds. They should never be allowed to get poor. They will be useful at three years old, and do half the work of horses, if kept in a cool, well ventilated stable."

In regard to carriage horses, he says, mere attention must be paid to fine heads and necks than is necessary in the case of cart horses. They may be bred from mares that can do the work of the farm thoroughly. They should be well selected, and the high stepping action not overlooked. Such mares crossed with a thoroughbred horse produce excellent carriage horses. The colts must not be neglected in their early keeping. If they are starved when young, and afterwards forced by high feeding, strangles, distemper, roaring, lameness, etc., will be the result.—*Genesee Farmer.*

LARGE GEESSE AND DUCKS.

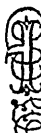
T the late Birmingham (England) poultry-show—said to have been "the greatest show ever seen"—the three first prize white geese weighed 67 lbs.; those which took the second prize, 62 lbs.; and those which took the third, 53 lbs. Young geese of the same breed weighed 52 lbs. and 50 lbs., the trio. Of gray and mottled geese, the first prize lot of three weighed 77 lbs.; those which took the second prize, 75 lbs.; and those which took the third, 70 lbs. Young geese in the same-class, weighed 63 lbs. and 57 lbs. the trio. The three first-prize Aylesbury ducks—a drake and two ducks—weighed 25 lbs.; those which took the second prize, 24½ lbs.; and those which took the third, 24½ lbs. The three first-prize Rouen ducks weighed 23 lbs.; the three which took the second prize, 22½ lbs.; and those which took the third, 22 lbs.

VENTILATION IN BEE-HIVES.

EES in winter do not apparently suffer from cold even when many degrees below the freezing point. Their great enemy is damp. I have known hives from which the bottom board had fallen and which were fully exposed to the air, winter well, while others carefully tended lost thousands of bees, and yet both had sufficient stores. Hives made on thin boards are bad quarters for bees, unless well ventilated, and for the simple reason that when such are exposed to the weather, they part rapidly with their warmth in cold weather, and unless carried off by currents of air,

the moisture from the bees condenses on the inside and then congeals, and this process will go on until the comb next the sides is involved, and the bees are consequently huddled together in an ice-house. When combs are thus frozen or kept steadily exposed to an atmosphere of moisture for some time, they will mould whenever the weather becomes warm. It often happens that the principal portion of the honey is laid up in the outer combs; and if these are frozen, the bees cannot get their food and may thus starve with food abundant, but locked up by frost.—*Ohio Farmer.*

WINTER BUTTER.

 IF I, through this article succeed in raising the quality, and increasing the quantity of winter butter, by a few practical remarks, my object will be fully attained.

Can butter be made during the last fall, and first two winter months profitably from cows that are "coming in" in the spring, and of nearly equal quality to that made in the spring and summer? My answer, founded on thirty years' experience, is affirmative.

First, I shall briefly state some of the reasons why it is not usually done, and then proceed to show how it may be done. Late in September, in this latitude we are visited by frost and chilling winds, increase in severity until the middle of October, when they have nearly changed the grass herbage of the fields to dry and dead stubble, over which our cows, reduced by the heavy drain of summer, are suffered to roam half-starved receiving only in addition a few cornstalks and pumpkins. As the season advances, from mild and warm to bleak and cold, the amount of food is too scanty to counteract the external cold by internal heat in consequence of which, and the absence of the succulent food which went to form milk, there is a constant tendency to a decrease in the flow of milk. To obviate this, as soon as the autumn frosts have fully taken the sweetness from the grass, the cows should be driven to the stanchions there to remain until the genial showers and sunny days of spring clothe the earth anew in her mantle of green. Both the cows and the fields demand this of the thrifty farmer. You should be well provided with cornstalks or sowed corn, pumpkins, carrots, turnips, and early cut hay; besides, I think you will find it more profitable and satisfactory to feed your grain

than to sell it at the best prices; have it ground, saving the head of the bolt for family use, which will give you a superior article for home consumption, and leave the balance to be fed to your cows, mixed with the waste milk and kitchen slops. No pains should be spared to induce the cow to continue her usual flow of milk; if she fails, the expense of restoring her may exceed the profit. Have your stables warm and clean, well littered, and well ventilated; feed often, water often, and salt often. Make good use of the curry-comb and brush, and throw a little salt occasionally on their backs, which will prevent vermin, by inducing them to lick themselves often, keeping the skin clean and smooth. Following these simple rules will secure a generous flow of milk without destroying your dairy for the ensuing year.

A plentiful amount of milk ensured, the next thing in importance is to render your goodly supply of milk remunerative, and I think in the general management of milk in winter greater defects are prevalent than in the management of the cows. If the milk is kept in too cool a place, whether milk-room or cellar, it becomes bitter before the cream is raised, and the butter will be bitter when churned, and soon become rancid; if allowed to freeze the cream rises, but is sadly damaged, and the butter will be both white and bitter. If kept on racks near a stove in the milk-house, the milk is too warm during the day, and too cool during the night; the consequence of which are nearly as deleterious as in the other case. These difficulties may be nearly, or quite overcome by the following method: Place the racks for milk in the kitchen or a room warmed by a cook stove where there is a fire constantly kept; suspend to one of the racks a thermometer, which should range at about 75 degrees during the day. At retiring, fill the stove with large sized durable wood, close the draught, and partially remove one of the back covers; in this way the fire will burn slowly through the night, furnishing a nice bed of coals in the morning. If the weather be very severe, the fire will need replenishing once or twice during the night, and in this way the temperature of the room will not give below 50 or 60 degrees. Owing to a law of nature this method is perfectly safe from liability to fire; by closing the draught very little air is admitted into the stove, and the little there is becomes highly rarified, so that when the back cover is removed the air of the room rushes in,

carrying both sparks and smoke downwards, thus preventing all danger of communicating fire.

Some people scald their milk before setting it, others do so after it has stood twelve hours, and a better method still is largely practised, that of taking the pans after they have stood twelve hours, and placing them in other pans containing boiling water, to remain till ready to skim; but from experience I consider the above method far inferior. For cleanliness, the tidy housewife will see the importance of having slide curtains suspended to the racks to be drawn aside when not needed; if arranged to slide on rings they are very little trouble.

The cream should be removed as soon as the milk is changed, and kept in a cool place where it will not freeze, stirring it often, and not allowing it to stand till it becomes bitter. The cream should be put into the churn in the morning, and stand till towards night near the fire, stirring it often through the day, and then it is not of

the right temperature, it may be warmed by adding some warm sweet milk, but never water, as that injures both the color and flavor of the butter. After experimenting with the thermometer, and trying various methods of regulating the temperature of the cream, I have adopted the following, as the simplest and most reliable: After churning a few dishes, I dip my finger in the cream, as it comes up to the dasher, and pass it quickly to my forehead, and if it produce no sensation of cold or heat, but simply of moisture, butter will come soon and in good condition.

By a careful observance of the above suggestions, I think butter may be made equal to that of Orange County, which now brings 34 to 36 cents in market. I believe also that from \$75 to \$100 clear profit may be saved from each dairy of twelve cows, by careful attention to the making of winter butter, instead of, as is usually practised, allowing cows to become dry at the approach of winter.

E. P. VAIL.

Delaware Co., N. Y.

ENGINEERING DEPARTMENT.

STEAM CULTIVATION.



A public meeting which was held in London, for the purpose of considering the best mode of extending the application of steam power to the cultivation of the soil, Mr. Holland said they all knew what the difficulties were of starting steam cultivation upon a farm, but after it was once started, and after the land had been for two years under such a system, they all knew how they were repaid for the capital employed in the machinery necessary for the purpose, and for the trouble and labor they had gone through. In steam cultivation they must not commence without having thoroughly drained the land, and after they had once commenced operations, they gained, more especially in heavy clay land, great advantages from the absence of the pressure of horses. With regard to the number of horses employed, he had in his own case at one time, 20 working horses under the old system, and he had now reduced that number to 12, after four years cultivation by steam. Younger horses had come in for the lighter work, which the steam had left to be done, and they had always a marketable value, like sheep or stock, or anything sold from the farm. But

the advantage from steam cultivation was that it enabled them to effect in a fortnight in the autumn, that which under the horse system would have taken six weeks. And these advantages were not obtained at a heavy cost. Where they used to plough with four horses at a cost of 20s per acre, they now ploughed by steam at a cost including wear and tear of machinery, of 10s an acre, and cultivated by steam at a cost of 5s or 6s an acre. After having had the system in operation for four years, his experience was that additional produce per acre under the influence of steam ploughing vs. horse was about 8 bushels. With all these great advantages arising from the system, how was it then that it had not been more generally adopted over the country? One reason was that the landlords were not satisfied as to the merits of steam ploughing, and consequently would still keep their small fields, and would not allow the numerous hedgerows to be removed. Another objection was to the amount of capital required to start steam plows. The amount of capital expended in his own case was £1000, and though a cheaper process might be employed, the farmer would still have to invest several hundreds. It had been considered that it would be of advan-

tage to start a steam-ploughing cultivation company, for the sake of supplying ploughs, engines, and other agricultural implements to tenant-farmers, and it was for the purpose of ascertaining what the opinions of the agricultural world were on this subject that the present meeting was called together. It was proposed to purchase the most improved steam cultivators and sell them to agriculturists upon the principle of a mortgage of the machinery, to be paid off by instalments: and whether this company was successful or not he was certain that its existence must prove a great advantage to the agricultural world.

Lord R. Montagu moved — "That the cultivation of the land by steam is now proved to be an advantageous and highly economical process, and that the machinery now used for this purpose is of a character sufficiently perfect to be recommended for the use of practical farmers.

Mr. James Williams, of north Court, Abingdon, seconded the resolution, and pointed out the advantages of steam ploughing in the capability of the machine to work continuously for any number of hours.

Mr. Brooke was not satisfied with regard to the economy of steam cultivation. He was a land-owner in Suffolk, and he had tried the application of steam to thrashing, but had found the expense greater than the receipts to defray those expenses. Except upon very large farms he did not think that horse labor could be superseded by steam.

The Earl of Suffolk moved — "That one great obstacle to the progress of steam culture is the inability of the generality of tenant-farmers to purchase the expensive machinery now used to break up and prepare the soil."

Sir H. Vavasour seconded the resolution.

Mr. Beavis, a Gloucester tenant-farmer, believed that a great deal was to be accomplished from the employment of steam-tackle for ploughing, and he doubted whether farmers, though an isolated class, were more backward than manufacturers in adopting anything that was for the good of their pockets. He should be glad himself to have the opportunity of hiring a steam plough, if it would do the work at 10s an acre.

Mr. Harrison, who could speak from his experience in connection with the Gloucester Steam Plough Company, declared that

the letting out of apparatus on hire was impracticable because unprofitable. The true way of assisting the promotion of steam cultivation was to do as the proposed Steam Company intended, sell the apparatus and receive payments by instalments. For the security of the Company it would, however be necessary to have additional guarantee of repayment; and that he proposed to obtain from the owner of the land. Let the tackle be in effect the property of the landowner (whose only part, however, would be to guarantee the payment for it) until the engine had by complete payment become the tenant's. He proposed — "That considerable advantage would arise to tenant-farmers and others from the establishment of a joint-stock company for the purpose of supplying steam apparatus to applicants, allowing them to repay the cost price by instalments extending over a certain number of years, on the principle of a rolling-stock company." In his opinion the purchase should be made by the landlord and tenant in conjunction, the company taking a bond from the landlord for the payment of the money.

Dr. Voelcker seconded the resolution, in a long and excellent speech, expressing his belief that by steam cultivation they could get from many soils an immense quantity of manure, and thus save a great deal of money in the purchase of artificial or the production of home-made manure; and there were many soils in this country which were not in a fit condition to receive the manure, if the farmer had a willingness to purchase guano, superphosphate of lime, or to apply his own farm-yard manure to the land which would be made fit by the operation of the steam cultivator.

A gentleman, the owner of sugar estates in the West Indies, spoke of the success with which steam cultivation had been introduced into Demerara, Barbadoes, and Antigua, had argued that attention should be turned to simplifying the machinery, and thus reducing its cost.

The resolution was carried.

On the motion of Sir George Jenkinson, seconded by Mr. Hutchinson, a resolution, approving of the objects of the General Steam Cultivation Company, and the mode in which it was designed to carry them into effect, was also adopted.

A cordial vote of thanks was then accorded to Mr. Holland for presiding, and the meeting separated.

THE LARGEST BARN IN THE COUNTRY.

THE Shakers are famous for their great barns, and the largest one that they have is in Lebanon, in New York. It was recently erected at an expense of about \$15,000, and is thus described :

It is 185 feet long, 60 feet wide, five stories high ; the walls of good, flat, quarried stone, five feet thick at the foundation, carefully laid in lime mortar, cement pointed outside, and plastered inside ; roofed with tarred paper, cement and gravel. It also has three wings, wooden buildings, which form four sheds about 100 feet long, upon the east and west side of two cattle yards, on the south of the main building, with lofts for straw and grain connected with the barn.

The lower story of the barn is a manure cellar, and the west end is level with the ground, so that carts can be driven in and out with ease. The next story is the cow stable which is on a level with the yard, the cows standing with their heads towards the centre, with a passage between supplied with water pipes and cocks. In this passage, roots, cut-feed, or water can be given in iron feed boxes, which swing on a pivot into the passage. Behind the cows the floor drops a couple of inches, a space of three feet, and beyond that rises again. This depression is to hold the manure. On the rise behind are iron rails, upon which cars run into the west end and over a space about 25 feet wide, and discharge their loads, the rails and a turn-table being so contrived that the manure is well distributed with but little labor. The idea is entertained of making the whole cellar into a liquid manure vat, which could be distributed by its own gravity upon the lower part of the farm, or sent higher up by the

water power that drives the mill not far distant. The cows are all fastened in their stalls at each milking, in summer, and all at one movement. They are driven in altogether, and each one takes her place where her name is printed overhead, and then by a pull of a cord all the movable stanchions are closed. They are opened by a reversed motion, and all the cows hurried out in a drove, so that they never make a deposit upon the floor. They are left a few minutes to do that in the yard before sending them to the pasture.

There are six large chimney-ventilators from the rear of the stalls to the roof. The floor above them supports the great hay mows, between which is the floor for feeding hay, which is sent down to the cows through box tubes, and these, when empty, also assist ventilation. There are openings from this floor into the straw lofts over the sheds, and also to the store rooms for roots and grain.

The next floor is the great drive-way for loads of hay, 16 feet wide and 196 feet long, with ample space at the west end to turn around. This floor opens upon a public road, and is but little above its level, so that loads really come in easily at the top of the barn. Over this floor is a fifth story, only the width of the floor, to give room for work, ventilation and light. Half of the many windows are glass, and half slatted blinds. The hay is nearly all thrown down, not pitched up from the load.—In case of need, the large space at the end can be filled, but it is thought that it will not be necessary, except with corn which can be husked there and thrown, down a spout into a large, airy granary, over the western shed.—*California Farmer.*

HORTICULTURAL DEPARTMENT.

VARIETY IN ORNAMENTAL TREES.

HALL we give up the attempt to educate our people up to the standard of European intelligence in Arboriculture? Or shall we continue to labor as we have for thirty years, to accomplish this object? This is a question which often occurs to us, as we look around us in our occasional rambles in our rural districts, and the same old trees which thirty years ago were planted, and are still being introduced,

as if there were no others suitable for the same purpose. Go where we may, avenues of limes, or elms, or maples, occur over and over again, varied, perhaps, once in a while, with an apple, a horse-chestnut or a poplar ; and in our pleasure grounds the same repetition is the rule, though there are, happily, some exceptions to it. Yet we seek in vain for that variety which adds so much to the charm of English landscape, or that interests us so deeply in every walk through an English pleasure ground. Take the

catalogues of our nurserymen, and, with a very few exceptions, a hundred or so of species and varieties comprise the entire number of deciduous and evergreen shrubs and trees; yet, of this small number how many can be found in one collection? But if we take the catalogues of the European or Continental Nurserymen how does the contrast stand? Why, in one now before us, more than 1500 kinds of hardy trees and shrubs are enumerated, besides 500 hardy enough for the climate of Great Britain. Of one single species, the oak (*Quercus*) there are more than 100 kinds; of the hawthorn (*Cratægus*) 75 kinds; of the maple (*Acer*) 30 kinds; of the ash (*Fraxinus*) 30 kinds; the acacia (*Robinia*) 20 kinds; the horse-chestnut (*Æsculus* and *Pavia*) 30 kinds; the beech (*Fagus*) 17 kinds; the apple (*Malus*) 17 kinds; and so on. Of shrubs, 50 are species and varieties of spiræas; of currants (*Ribes*) 40; Philadelphus, 25; honeysuckle (*Lonicera*) 25; Viburnum 20; Spindle Tree (*Eunonymus*) 12; plum (*Prunus*) 12; althea (*Hibiscus*) 12; dogwood (*Cornus*) 10, &c., &c.; while of the coniferous trees the number is immense, all adapted to some part of the United States, though a majority of them are too tender for the North. Yet of the really hardy sorts, there is quite enough to make a most agreeable variety around every country or suburban home. Why then such a repetition of the Norway spruce and arbor vitæ, everywhere? Where are the noble pines, the broad and magnificent cedars, and the giant spruces, whose summits tower above the highest temples?

Our interesting correspondent, the Rev. Mr. Gridley, in an article in the early part of the volume has alluded to the introduction of more variety, especially of evergreens, and pertinently inquires why we should rely so much upon the "inevitable balsam fir, and Norway spruce," when we might accomplish more by using also the numerous pines, junipers, arbor vitæ, &c., which give us more novel forms and shades of color." But the evergreens are not all that give us novel forms and shades of color. The deciduous trees and shrubs are quite as varied in their qualities. What greater contrast than the silvery hue of the Rosemary-leaved willow and the delicate green of other species? How different both the summer and autumnal hue of foliage of the Norway and the scarlet maple; or that of the English and American scarlet oaks. The former, verdant even after heavy frosts;

the latter, one glow of scarlet ere they have nipped the tenderest plant: one with its small, rondishlobed, the other with its large, sharply-toothed leaves. How different the American beech, one of our grandest trees, from the English cut-leaved, or the English maple. And even in the well known elm, how much is there of variety in the purple leaved, crisp-leaved, broad-leaved, twiggy-branched, Scotch, and other kinds.

But leaving out the variety of our more familiar trees, how few know the beauty, or at least avail themselves of it in their gardens and grounds, of those more rare, though many of them indigenous and abundant in our woods and forests: these are the magnolias—*azuminata*, *tripetala*, *auriculata*, and *cordata*; superb, both in foliage and flowers; the gems of deciduous trees. The liquidamber, with scarlet, purple, and gold-dyed starry foliage: the hornbeam, covered with its hop-like catkins; the Tupelo tree (*Nyssa*) one single specimen of which—for it rarely grows in groups—lights up with its fiery foliage the sombre hue of some swampy woodland. How few recognize in the scarlet and yellow flowered horse-chestnuts, any relation between them and the common white. How pleasing the contrast of the *Carragana arborescens*, with its yellow, and the Judas tree, with its rosy-colored pear-shaped blossoms. The *Cornus florida* suggests the idea of a huge tree rose so much does its large snow-white bracts resemble the single white or Cherokee rose of the South; and of the hawthorns (*Cratægus*) a group of small trees, natives of both continents, cultivated in every English garden—its beauties sang by the poets—how few of the 75 kinds are even known by name. Yet they are very different from each other, both in blossom and fruit, as well as in foliage and wood. Thirty out of forty kinds imported more than twenty years ago, form a collection of this attractive tree whose beauty and variety have been a constant source of pleasure and delight. In winter their thorny spray: in spring their varied blossoms: in summer their dense foliage, and in autumn their many colored berries—some scarlet, some green, some yellow, some black, either large, medium sized, or very small—all contribute to render this group of the highest interest and value. "Where, indeed," asks the late Mr. Loudon "would the planter find a genus which would afford him so many resources as that of *Cratægus*?"

But these are not all. We have yet that

abundant tree of the Middle States, the Tulip, whose thick, deep green and ample foliage, and large cup-shaped flowers, stamp it as one of the noblest objects in ornamental plantations: also the Virgilia, a western tree, but hardy everywhere, whose clusters of locust-like blossoms depending from its leafy branches render it always highly beautiful; the Ptelea, recently christened and introduced as the hop-tree—from the abundance of its chaffy seeds, borne in masses all along the branches, which answer as a substitute for the hop. But we prefer to buy our hops, and leave the seeds to ornament this very pretty tree.

The ash and the lime are no exception to the general variety, for we have the cut leaved and broad-leaved linden, the latter with leaves nearly a foot broad; and the gold-barked and red-twigged, &c. Of ashes, the myrtle-leaved and walnut-leaved; the aucuba-leaved and gold-spotted leaved, as well as the dwarf globe-headed; and of the Mountain ash, the oak-leaved, pear-leaved. The Kentucky coffee tree, with its sparse blunt shoots and huge seed pods. The Salisburia, or Maidenhair tree, unique in its foliage. The Sophora, with its mimosa-like leaves and clusters of white blossoms,—these and many more are but a part of the immense variety which have been introduced into the parks and pleasure grounds of Great Britain, and to the collections of a few of our enthusiastic and tree-loving American nurserymen. We leave out altogether the great number of variegated-leaved trees which have been so recently introduced that they are yet rare even in choice collections.—*Ohio Farmer.*

GRAPE CULTURE.

IN certain parts of the North the cultivation of the grape for market and for wine manufacture is quite extensive and rapidly increasing. The Sandusky (Ohio) Register says that some idea of the magnitude of the grape interest in that vicinity may be gathered from the following facts respecting the vineyards on Kelley's Island. There are probably in bearing the present season, on the Island and main land, about 10,000 acres,—4000 on Kelley's Island alone,—of which 700 acres are in full bearing. Another year the quantity in bearing will probably reach 2000 acres, with a larger setting out than ever before. About 2,000,000 cuttings were made on Kelley's Island alone last spring, and probably in this entire grape region the number reached to 5,000,000.

A MAMMOTH CALIFORNIA PEAR.

DECIDEDLY the finest pear at all points ever exhibited in this city was brought here from San Francisco a few days ago, by Mr. B. Phelps of that city. This magnificent pear weighed two pounds two and a half ounces, and is of the variety known as the Duchess d'Angouleme. It was raised in Los Angeles, picked on the 20th of August, is now in perfect condition, and without a blemish. Other and larger pears of an inferior variety have been shown as the products of California; but of the superior kinds none have approached the one alluded to for beauty, size, and rare excellence. It is not for pears alone that California stands so pre-eminently distinguished as the garden of Pomona; her vineyards are alike remarkable for their extent, the number of vines and the superior excellence of the fruit, comprising no less than one hundred and sixty well defined and separate varieties of grape, from the spicy Muscats and luscious Hamburgs to our native Isabellas, Catawbas and Delawares.—*New York Herald.*

THE EVERGREEN HONEYSUCKLE.

The American evergreen Honeysuckle is the most beautiful and valuable, for it flowers from June till the frost nips its blossoms. It has strong branches, bearing evergreen leaves and fragrant flowers, which are bright red outside and yellow within. All the sorts are produced or propagated by layers or by cuttings. The honeysuckle loves almost any soil, provided it be not too dry.

CULTURE OF THE HOP.

WITHOUT speaking in relation to the existing plantations of hops, I will in a general way indicate the description of soil to be selected for new ones. The variety of hops also is by no means a matter of indifference, inasmuch as some of the coarser kinds will flourish on soil where those more delicate will not grow at all. The Canterbury, Farnham and the Goldings, are the deepest rooted, and require a deep soil. The other varieties are more shallow rooted, and will grow on a lighter soil. Some growers of hops think best, when the Grape or Kent hop, so called, is grown on a rich soil, to use three poles to a hill, which is a mistaken idea in the culture of hops, for it is not wise to overcrowd a field or yard with poles, for it renders the fruit imperfect; and in a

wet season, with a viny growth, it frequently happens that the crop is much diminished by allowing too many vines to grow up the poles.

After the first year's crop, commencing with the second year's crop, before the poles are set, the earth, by grubbing around the hills, should be removed so as to expose the vines of the preceding year down to the crown of the roots; the old stalk and suckers or offsets which may have sprung from the preceding year should be cut off closely with a sharp knife, leaving the crown of the hill in a convex shape. Cover the hill again with a thin coating of fine earth mixed with manure or other fertilizer, as may be, care being observed at the time to stick up a mark to hills which are weakly, and will require smaller poles. Grubbing and pruning should be strictly adhered to in order to secure a good crop, and prevent the worm increasing. I have experimented on a few acres of hops in order to save labor by not pruning and grubbing, by trying to subdue the worm by using materials that I knew were not injurious to the hop vines. The effects were, the hop began to decrease by the worms working and eating the vines, so much so that some of the vines were entirely eaten off after they had reached the top of the poles. I know no better way than pruning and grubbing, for it helps very much in subduing the worms, although many times the worm makes such havoc on the vines that it becomes necessary to go through the yard the second time, which is done by working the worm from the hill by a sharp stick. As a general thing the worm is found where the best and thriftiest vines grow, near the bed roots. In the management of hop grounds it may be laid down as a positive rule that the ground should be kept clean from worms and weeds, and the soil kept well enriched.—DANIEL B. SHAPLEY in *Country Gentleman*.

"GARDENS AT RAILWAY STATIONS."



HIS is the title of an article in a London paper commending gardens found at the stations on the lines of some of the railways in the mother country. It suggests the propriety of saying something on this subject here in these United States. It is important that our railway corporations should more completely and practically recognize the influence of the distribution of horticultural knowledge and facts; of the value to them of the cultiva-

tion of horticultural taste among all the classes which in any degree minister to their prosperity.

Those who have traveled have not failed to notice how quickly the American's eye takes in and notes whatever is symmetrical and beautiful, either in landscape or architecture. The writer has had occasion to pass through Hamilton, Canada, on the line of the Great Western Railway, often, and has noted with no little pleasure the effect upon the passengers of the sight of the grassy, well shaven slopes that line the deep cut just east of the station, and the pretty *parterres* of flowers set like brilliants in the area about the Station House. No man who has once passed and seen this evidence of good taste and good management on the part of this corporation, but anticipates with enhanced pleasure his next visit there. We are always impatient to get to Hamilton on account of the flowers: and it is one of the pleasures pertaining to this route to the Great West which we place to its credit.

There is a station on the line of the Illinois Central Railway, whose resident agent is a man possessed of horticultural taste and skill; and each nook of corporate ground unoccupied by the business of the road, is made to blossom like the rose. And thus, although in the midst of a marsh, Calumet Station is a pleasant place—the traveler leaves it with pleasant remembrances of good coffee and bright blossoms of beauty.

At the stations of many of the roads trees have been planted and inclosed. During the past season this has been done to a considerable extent. It is well; it will be better if floriculture is included. We hope the time will come when these roads will find it necessary to create a Department of Horticulture, and place as its head a competent man to superintend the garnishing of the hard lines of business, traffic and travel, with something that will gratify the taste, employ the mind of the traveler and protect him in winter from the terrible sweep of wind and snow which now has no obstructions.

This is a subject which will bear further discussion, and there are objects to be attained that deserve the aid of impotunity. For it is a matter which relates to the reputation of States as well as corporations: to the comfort of the travelling public as well as its pleasure. It is a subject which must be kept before the people.

KEEPING PEARS IN THE FRUIT ROOM.

THE keeping and ripening of pears, after the period of gathering fruit in the autumn, has not, we think, received that careful attention, in this country, which the importance of the subject demands. Many late autumn and winter pears have no doubt been condemned by growers from want of knowledge of the art of keeping and ripening them, and it is probable that we shall never succeed in the production of such pears until we learn more of this art than is at present possessed by the public at large.

Late autumn and winter pears, when kept in the ordinary way, in drawers or boxes, in common rooms or cellars, shrivel, rot, and fail to ripen satisfactorily. What shall be done? How shall they be kept? In a fruit room or in a cellar? If kept in a room, late in the season, we must have a fire in the room, as they will be frosted, and a fire creates too much *dry air*; if in a cellar, it may be difficult to keep the temperature low enough, (on account of the earth-heat,) without inducing dangerous currents of air.

At what temperature will fruit keep best? We are told by some writers 36 to 40 degrees. Now in a cellar it will be found difficult, without admitting air from without, to get a temperature in winter lower than 50 to 55 degrees. It is very desirable, so the writers generally tell us, to prevent fresh air (fresh oxygen) from coming in contact with the fruit: the less it is ventilated the better, if the atmosphere is not too damp.

But who knows that a temperature of 50 to 55 degrees will not answer? Is a temperature of 36 to 40 degrees indispensable to success? If so, how can it be attained most conveniently and economically? Then what shall be the degree of humidity or dryness of the atmosphere, as shown by the hygrometer? It has been proposed to reduce the temperature of the fruit room by means of an ice-chamber over the room, (Nÿce's plan), and by means of currents of cold air from an ice box. But here the danger of excessive moisture is evident, and it is then proposed to absorb the moisture with lime. All these are troublesome operations, and demand much care and expense.

We should be glad to hear some reports of the experience of fruit growers through the columns of the RURAL, on this subject. We trust, also, that the new horticultural

contributor will give us the benefit of his knowledge. We want to know how to keep late winter pears, easily and cheaply, not till late in the spring, or beyond the usual period of ripening, but till February and March. A neighbor of ours, who grows a few pears, says he thinks there is no such thing as a *winter pear*: all pears, so called, he contends, are only *fall pears that never ripened*. If we were to judge only by the specimens of winter pears we commonly see, we should say that our neighbor was not far from correct. Can we not inaugurate a better management of winter pears?

POIRIER.

REMARKS.—This is one of the most important topics connected with fruit culture, for present discussion, and we solicit those of our fruit-growing readers who have experience, to favor us with it. We shall give our own in a short time.—B.

FRUIT CULTURE IN WESTERN NEW YORK.

NEVER since the settlement of the country, says a contemporary, have the fruit-growers of Western New York reaped such a golden harvest, as the present season. The crop was large, the fruit fair, and the prices have been more than remunerative, for streets in the neighborhood of the docks and shipping warehouses have been blockaded with barrels of apples, and we observe the same state of things along the line of railroad and canal, all through the western part of this State. The local papers in several of the leading villages have given estimates of the amounts received by the farmers in their several localities, also the number of barrels shipped, but these, in most cases, are quite incomplete.

The Peach crop was small, but the prices good, and many growers are getting encouraged to hope that our seasons are becoming more favorable for this delicious fruit. We have long thought that the leading business of Western New York would be the production of fruit for shipping.—This opinion we have expressed, on several occasions, and time only confirms the statement.—Many this year will agree with us, who would not have done so before. The farmer who has in his pockets \$500 or \$1,000, as the profits of a small orchard, has an argument on this subject, which he is not anxious to resist. In times of such prosperity there is always danger. For years we have urged the importance of giving more care to the orchard, looking after and destroying insects, &c.

and this success is doubtless the result of increased care. We must not now rest from our labors, and think the battle fought and the victory won. Constant vigilance is the price of good fruit. Watch the insects, destroy the caterpillars' nests, put out new trees and take care of them. The following warning, which we gave several years since is needed now as much as ever.

The seasons are beyond our control, but there are things lessening our fruit crop, and which must be charged to the carelessness of cultivators. The principal of these is the rapid increase of insects. With the increase of fruit culture, which furnishes them the means of subsistence and propagation, the fruit-loving and fruit-destroying insects have increased in a four-fold ratio, until almost every apple orchard is swarming with caterpillars, bark lice, &c., the luscious plum and the apricot are banished from the garden by the curculio, the currant, that everybody supposed could be grown in any out-of-the-way corner, uncared for, is eaten by the gooseberry fly-grub, the garden disfigured by its bare limbs, and every hill of melons swarms with *flies*, *striped bugs* and *squash bugs*, and fortunate or persevering is he who saves a single hill from their ravages. Here and there a cultivator has been diligent to destroy injurious insects, but as a general rule they have been allowed to increase unmolested until they have overrun our orchards and gardens. We need plain talk, and prompt, thorough action, on this subject. Every one should not only attend to his own garden and orchard, but urge upon all his neighbors a similar course of action, for a few cannot arrest this evil. It should be

made the subject of discussion in every farmer's club, in every neighborhood, and in every farm-house; and every one should be zealous to set a good example to his neighbors.

It is useless to wait for any patent remedy, any Paixhan gun that will annihilate an army of insects at one discharge. Untiring watchfulness and diligence is the price of success in this work. The best of remedies will fail if not faithfully and repeatedly applied. Wage a war of extermination, and if one thing fails, which you supposed to be *easy* as well as *certain*, try another that you *know* to be *certain*, though more difficult; catching and killing is sure death in all cases.—*Rural American*.

PACKING GRAPES FOR MARKET.

THE following is from the proceedings of the New York Farmers' Club:

One of the most interesting features was a fine show of grapes from the Rev. J. Knox, Pittsburg, Pa., which, notwithstanding their long railway journey, appeared as fresh and well covered with bloom as though just from the vineyard. Perhaps the secret of this is worth knowing. The grapes are transported in shallow baskets, upon the bottom of which green grape leaves are placed, and also against the sides; then a layer of bunches, and then more grape leaves, and so on, and leaves on top, upon which the lid presses, and holds all firmly, but does not prevent the free circulation of air. In this way Mr. Knox sends grapes five hundred miles to market in perfectly good order.

DOMESTIC ECONOMY.

THE MOST APPROVED METHOD OF SAVING AND PREPARING RENNET FOR CHEESE MANUFACTURE

THE proper saving and preparing of rennet is to the dairyman of the utmost importance, since no degree of skill in the art of cheese-making will be able to produce a prime article of cheese unless good sweet rennets be used. Generally too little care is taken by dairymen in this matter, and not unfrequently it is the cause of inferior and worthless cheese, among cheese makers of experience.

It is always best for the dairyman to have the rennets selected and cured under his own immediate supervision, and not depend on purchasing, unless they can be had of parties who are experienced in the business, and who will warrant the article good.

Calves' rennets only should be used, for although the stomach of the hog and of other animals will coagulate milk, yet the cheese made from it will not be prime. In selecting the rennet, the calf should be healthy, and should have been allowed to

run with the cow long enough, that there be no mistake as to this point.

Our practice here in Herkimer Co., New York, is to allow the calf to have free access to the cow, and take what milk it will for four or five days. If it prove healthy and active, it is then kept from twelve to fifteen hours without food before it is slaughtered. The blood should flow out as rapidly and completely as may be. The stomach should have a white and healthy appearance; if dark and discolored in spots, or showing inflammation in any of its parts, it is rejected, since one bad rennet will, when it comes to be used with others, impart its taint and do much injury. The stomach is emptied of its contents, but not washed or rinsed with water; and, if the weather is cool, may be laid on a plate or earthen dish for a day or two, sprinkled with a little salt, and finally it is rubbed with salt in all its parts, and stretched on a forked stick or on a hoop, and hung in a dry atmosphere, in a room with moderate heat only, as much heat while curing injures its efficacy.

If hung in a stove room or near a stove-pipe in daily use, the heat will be likely to destroy in a measure its strength; on the other hand it may be allowed to freeze without injury, and to advantage, since freezing seems to increase its strength and efficacy.

The plan adopted by some, of salting down the skins in a tub or barrel, is not a good one, and is deprecated by our best dairymen. Rennet needs exposure to the air whereby to undergo a certain slow process of decomposition, or I might perhaps say, oxidation. When thus kept a year or more, strength has accumulated, while a peculiar rankness and fermentating power has passed away, putting it in condition to produce mild and fine flavored cheese. Green, or newly cured rennets are apt to cause "huffing," or swelling of the cheese, and are thought to be prejudicial to the fine flavor of the cheese. There are some curious things with regard to and in connection with rennet which are shrouded in mystery, and are a puzzle to scientific men. Professor Johnson argues that the efficacy of rennet does not depend upon anything originally contained in the stomach, but upon something derived from the stomach itself.

"By exposure to the air," he says, "the surface of the membrane has undergone such a degree of change or decomposition

as to enable it to induce the elements of the sugar to alter their mutual arrangement, and to unite together in such a way as to form lactic acid, and thus the action of the rennet resolves itself into a curdling of the milk by the action of its own acid." And he reasons that after its use it may be again salted and dried, and thus used several times.

It may be well to say with regard to salting and drying and using rennet over again, after its strength has been once exhausted, that the Professor has fallen into an error. It cannot be made to accumulate strength in this way, after having been thoroughly exhausted, as I have repeatedly demonstrated by numerous experiments.

In preparing rennet for cheese manufacture, the rule here is to use one gallon of water for each rennet. Six rennets may be used at a time with six gallons of water, (soft water or clean pure rain water is best) and placed in a stone jar; wooden vessels for this purpose should never be used, as they are apt to contract taint, and tainted rennet is a source of infinite mischief, even when the taint is very slight and unsuspected.

The rennets (salt being added so as to form a strong brine) should be soaked and rubbed out gently, from time to time, for several days, when the liquor may be drawn off, strained through a cloth, and put in bottles and corked up, or placed in a stone crock, and is fit for use. If the rennets are good, two gills of the liquid will be sufficient to thoroughly coagulate sixty gallons of milk.

The rennets may again be soaked and rubbed until their strength is exhausted. They will need stirring in the brine daily, as well as in the liquid previously drawn off, (if not corked in bottles) in order that no taint be contracted. It may be well to say that rennet should always be kept in a cool place.—X. A. WILLARD, in *Pr. Far.*

HOW TO SELECT FLOUR.

First—look at the color; if it is white, with a slightly yellowish, or straw-colored tint, buy it. If it is very white, with a bluish cast, or with white specks in it, refuse it.

Second—Examine its adhesiveness; wet and knead a little of it between your fingers; if it works soft and sticky, it is poor.

Third—Throw a little lump of dry flour against a dry, smooth, perpendicular surface; if it falls like powder, it is bad.

Fourth—Squeeze some of the flour in your hand; if it retains the shape given by the pressure, that, too, is a good sign. Flour that will stand all these tests, it is safe to buy. These modes are given by all flour-dealers, and they pertain to a matter that concerns every body, namely, the staff of life.

CLEANING MILK VESSELS.

CORRESPONDENT of the Cincinnati Gazette says there is no product of the farm that presents so much difference as butter. This arises chiefly from using vessels for holding milk, and utensils in making the butter, which are soured. Milk has a peculiar acid, very easily formed, which entirely takes away that rich, sweet flavor belonging to good butter. A very little soured milk or cream on vessels rapidly generates enough acid to take it away. To avoid this great care is requisite. Cleanliness only is not sufficient, in having the vessels well washed, but they must be carefully washed in boiling hot water, and should be boiled in it also. But as cream is very apt to stick, even in good washing, when the vessels are boiled in water, some pearlash or soda should be put in it, which destroys any acidity that may be about the vessels. They should then be sunned. I have known some good butter-makers who dispensed with the sunning when soda was used, but both are recommended.

THE QUEEN OF PUDDINGS.

ONE pint of nice bread crumbs to one quart of milk, one cup of sugar, the yolks of four eggs beaten, the grated rind of a lemon, a piece of butter the size of an egg. Bake until done but not watery. Whip the whites of the eggs stiff, and beat in a teacupful of sugar in which has been stirred the juice of the lemon. Spread over the pudding a layer of jelly or any sweetmeats you prefer. Pour the whites of the eggs over this and replace in the oven and bake lightly. To be eaten with cold cream. It is second only to ice-cream, and for some seasons better.

HINTS TO MOTHERS AND DAUGHTERS.

THE following, from the Boston Cultivator, will, we fear, be attributed by our lady readers, to the pen of some crusty old bachelor. It will however, do them no harm to read

GOOD ADVICE.—To marriageable young ladies a word of advice: a man is better pleased when he has a good dinner upon his table, than when his wife talks good French.

Will the girls approaching that enterprising epoch in life, termed "marriageable," by our contemporary, make a note of this as should their mothers, also, and see that the education of all who are approaching this interesting and important era in their lives, be directed as is befitting those who are to become wives and perchance mothers? Let every marriageable young lady" (in respect to age,) keep in mind, that though she speak with the tongue of a man and is possessed with the gift of prophecy, and understands the mysteries of all languages, and all knowledges, physical and metaphysical, ornamental and musical, and yet knows not how to keep house, she is unfit to become a wife and matron. It is easy to obtain girls and women to teach schools, to keep books, to be copyists, to sell goods, to work in factories, to work as seamstresses in shops and families, to set types, ay, to do almost anything outside of housekeeping, and yet how exceedingly difficult it is to find one who understands the culinary arts, with all the other accomplishments of good housewifery, without which, all the other learned acquisitions are of little worth in a wife, and with the wifely attainments, the absence of all the others will hardly be missed, for a good housewife, fitted for her sphere, is the true gentlewoman.

We would not have the reader infer that we place a low estimate upon woman's literary attainments from what we have now said. Far otherwise; for we would have every "marriageable woman," especially, literally educated in the largest sense of that phrase, that is to say, she should be instructed in the mysteries of housewifery as well as in the arts, sciences, literature, and all aesthetic accomplishments. But a blue who knows nothing of house-keeping, is not a help meet for any man who has a stomach as well as a soul to be cared for during his sojourn on earth. The stomach has about as much to do in the formation of the character and the reputation of a man as his creed. Hence, the cook is about as essential to the success of intellectual, moral and religious culture, as the curate.

REPAIRING TOOLS IN WINTER.



Y good management the labor of repairing tools is much lessened. Selecting the strongest and best made, using them with reasonable caution, breakages would rarely occur. We do not mean to say that tools could be as perfectly constructed as Dr. Holmes' "One Horse Shay," which lasted a hundred years, and then fell to pieces in a moment at every part, so perfectly was its strength equalized throughout; but a careful selection from the best manufacturers will prevent many of the accidents which happen to implements and machines made by bunglers. Large farmers cannot always secure careful hands, and good implements must therefore be occasionally broken. Repairing, therefore, forms a considerable part of every farmer's business. Some of this may be done at home with little trouble; in other cases it is best to employ at once a mechanic, especially for repairing all large articles, such as thrashing machines, waggons, plows, &c. A little skill will often be quite useful, however, in winter, and on stormy days, in repairing smaller tools and implements, and for this purpose a supply of proper materials should be always at hand. One of the most useful articles is copper wire. It should be kept of different sizes. It is one of the strongest metals except iron, does not rust through, and is almost as flexible as leather, allowing it to press closely and fit the parts, and twisting in a close coil. Wherever portions of wooden tools are split, a few bands of copper wire will effect a substantial repair in a few minutes. Next to copper wire, in value, are strips of sheet copper. These are useful on larger pieces of wood, split plank or split timber. Lay the strips of copper across the fracture or pass them around in the form of bands, and then secure them to their places by

driving in small nails, and great strength will be imparted. If the wood is very hard the points of the nails should be dipped in grease, which will cause them to drive freely.

When copper wire cannot be had, very strong bands may be placed around fractured rods of wood as follows: Procure the smallest sized annealed iron wire. (not much larger than horse-hair, which, although so small, is very strong,) and use it so as to form a neat band, around the fractured rod then heat the wire in the flame of a lamp, turning it over, so as to warm every part alike, and then apply a stick of burning sealing-wax to the band afterwards heating and melting the wax thoroughly into the wire, by turning it in the flame. The iron and wax thus become thoroughly incorporated together, and form an exceedingly hard, strong and durable band. This is an excellent mode for mending canes, umbrellas, &c.

Prepared glue is a very useful substance to keep on hand, for mending all small wooden tools and vessels. It is easily made by dissolving good glue in alcohol in a large-mouthed bottle. In a few days the glue will be perfectly diffused through the alcohol, and the mixture ready for use. If too thick add more alcohol; if too thin, allow it to evaporate.

Almost every practical farmer may add some suggestions to these directions, the results of his own experience. These suggestions we should be glad to receive from any of our correspondents.

TO CLEAN BRITANNIA METAL.

Rub the article with a piece of flannel moistened with sweet oil; then apply a little pounded rotten stone or polishing paste with the finger, till the polish is produced; then wash the article with soap and hot water, and when dry, rub with soft wash-leather, and a little fine whiting.

COMMERCIAL REVIEW.

MONTREAL MARKETS.

Potash, per cwt.,	\$6.10 to 6.15	Wheat, U.C. White, per 60 lbs., ..	\$0.90 to 1.02
Pearlash, "	6.85 to 6.90	" U.C. Red, " ..	0.90 to 0.91
Flour, Fine, per 196 lbs.....	4.00 to 4.10	Peas, per 66 lbs.,.....	0.70 to 0.71
No. 2 Superfine,.....	4.20 to 4.25	Indian Corn, per 56 lbs.,.....	0.55 to 0.56
No. 1 "	4.30 to 4.40	Barley, per 60 lbs.,.....	0.80 to 0.85
Fancy "	4.50 to 4.70	Oats, per 40 lbs.,.....	0.47 to 0.50
Extra "	5.20 to 5.30	Butter, per lb.,	0.15 to 0.16
S. Extra Superfine	0.00 to 0.00	Cheese, per lb.,.....	0.08 to 0.08½