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LOWER CANADA

AGRICULTURIST

MANUFACTURING, COMMERCIAL, AND COLONIZATION INTELLIGNCER;

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.

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AGRICULTURAL REVIEW.

DECEMBER.

MECHI, AND THE CAUSE OF HIS SUCCESS.

ALL our readers have heard of J. J. Mechi, or as he is now called "Mr. Alderman Mechi." He is, in many respects, a remarkable man. He made money by selling razors and razor strops in Leadenhill street, London. He still, we believe, carries on the business; but if this were all, he would have remained, like thousands of successful merchants, unknown beyond the narrow circle of his commercial and social acquaintances. But he turned farmer, and soon found himself famous. This did not annoy him—he rather courted notoriety. He endeavoured to show that farmers could make more money if they would adopt a better system of agriculture. He contended that his farming was highly profitable. Now, it is easy to understand why farmers who live on rented land should not like to have it shown how they could make more money and *pay higher rent*. James Caird, a Scotch farmer, obtained celebrity in the same way. He wrote a pamphlet entitled, *High Farming an Antidote to Free Trade*, and got soundly abused for his pains. The late Sir Robert Peel, who wished to repeal the duties on foreign grain, took him up. The London *Times* employed him to visit the different counties of England as "The *Times* Commissioner," and he wrote a series of letters to that paper—some of which were not flattering to the farmers. Some of them were very indignant. The *Times* defended its correspondent, and in the end he was elected to Parliament—and all owing to his taking up of an unpopular cause. So with Mechi. He boasted long and loud as his profits as a farmer. Many of his statements were open to criticism, and he did not escape. He soon became the butt of ridicule. Paper bullets flew around his head like hail. The agricultural press joined in the crusade against him. His ideas were ridiculous, his facts were considered doubtful, and his conclusions certainly erroneous. Still, Mechi lived and thrived—nothing ruffled his temper. He invited his opponents and his friends alike to visit his farm and see for themselves what he was doing. They came. Some criticised, some praised; but all were treated with courtesy. His "Annual Gatherings" soon became what we should call an "institution." Landlord and tenant, the practical farmer and the man of science, met at Tiptree once a year to examine, to discuss, and to criticise his operations.

The recent English papers are full of accounts of the last gathering at Tiptree. A correspondent of the *Mark Lane Express*, while still disposed to criticise, writes on the whole favourably, as follows:

"Any one was free to go where he liked—to make his own observations, and draw his own conclusions. Here is the farm; here round about it is the heath, out of which it was snatched some 22 years since. One, at the present day, is growing furze, the other is growing immense crops of grass, clover, wheat, beans, oats, mangolds and turnips, and produces annually 200 pounds of meat per acre. The one by the investment of nothing is worth nothing: the other, owing to the judicious investment of a large capital, is commercially speaking worth 50s. an acre. There are certainly no cereal or root

crops in the neighborhood to compare with those at Tiptree; and if some of the surrounding farmers produce as much as 20 pounds of meat per acre from their land, it is all they do. And what is the secret of this change? Efficient drainage, deep tillage and liquid manure irrigation.

"I am not disposed to contend that Mr. Mechi's is now, in all respects, a model farm. In fact, I do not think he has a right to invite people to inspect it as such, until he has moved a little more ahead of the times; For instance, his system of drainage is somewhat antiquated. He is at great expense by horse-culture to secure a deep staple—and he yet clings to small stetches as though he lacked faith in drainage, combined with tillage, to lay the land dry. Numbers of the fraternity have outstripped him in this respect, and the only novelty now to be seen at Tiptree is the system of manuring. Even the feeding of cattle on boards has been copied, and while he must give up for a while the credit of being first, he may rest on the reputation gained for having led others to the front. There can be no doubt that Mr Mechi's exertions have been productive of immense good to this country, and he may well be proud of the part he has played as a promoter of agricultural progress.

The visitors were of course conveyed to the immense cauldron, where with incessant seethe and bubble, the root food of the farm is concocted. Throughout the day, solitary individuals might be seen, apparently meditating suicide, and a blissful transformation to the cabbage state—over this deep and dismal abyss. The whole of the manurial matter of the farm passes into this tank, and is then sent flying over the rye grass, wherever it may happen to lie. The farm consists of 170 acres, of which 12 acres were always in rye grass—and thus treated after each crop is taken off. The clover and permanent rye-grass are all thus irrigated with liquid manure, which is forced through iron pipes, and driven through hose and jet attached at certain places along the mains. Owing to this process, which was shown, the worthy Alderman can talk of three and four tuns of rye grass at a cut, and of several cuts in the year; of several cuts of clover, and two tuns at a cut; of splendid crops of permanent grass, and of unfailing crops of grain and roots after these—in seasons when the farmers around are complaining of utter failure. The effect of irrigation is illustrated by a field of five acres, opposite the drawing room windows, amongst the rank herbage of which Aunt Sally was suffering reproof of her obstinate attachment to the pipe, as compared, with the lawn, which had never been dosed, and looked as drab as a felt hat. The quantity of liquid put on per day amounts to about 60,000 gallons: and whether it is owing to the effect of this, or to the depth to which the land is broken up after its application I know not, but certain it is that there is hardly a weed to be seen. It is very seldom that one sees to clean a farm. Mr. Mechi attributes this absence of weeds to the subsoiling process, which goes on in conjunction with the plowing six horses being employed in the two operations. The long tap-roots are thoroughly embedded, he says, and the expenses of hoeing and weeding the cereal crops now growing are stated to be in some cases only 1s. —and in no case more than 2s.—per acre.

"Although Mr. Mechi's example has been followed in efficient drainage and deep culture, very few men have had sufficient confidence in irrigation by hose and jet to venture upon an outlay of £5 an acre to secure its advantages. I can not but think however, that the example is as worthy of being followed in this respect, provided only it be done with due caution, as it is in the others. At least one is disposed to think so, judging by appearances."

That Mr. Mechi succeeds in raising enormous crops, there can be no doubt. The only question is, will such a system of agriculture pay? Mr. M. says *it will*. The majority of English farmers say it will not—and this is the bone of contention between them. That Mr. Mechi has made his poor, almost worthless land, the richest farm in the country is admitted. That he raises enormous crops is equally undeniable. He has done this, first by thorough underdraining—sometimes putting the drains seven feet deep, and generally five feet, and from 20 to 40 feet apart. Second, by purchasing a large amount of oil-cake, corn-meal, beans and other cattle food, and feeding them to stock on the farm. Third, all the manure is applied in a liquid form. It is conveyed and distributed over the farm through iron pipes. Fourth, deep and thorough tillage.—*Genesee Farmer.*

Colonel Dudley, of Royalton, Vermont, has cut six tons of hay to the acre this season.

WINTER EVENINGS ON THE FARM.

THE autumnal equinox is past. Gradually, but surely, the days are shortening, while the nights are correspondingly lengthening and the cold, northern breezes, the occasional frosts, and the falling leaves admonish us that winter, with its early evening twillight is rapidly approaching.

The leisure hours brought by this not altogether unpleasant season of the year, afford abundant opportunities for the intellectual improvement of those who may feel inclined to advance themselves in this direction, and especially should the younger members of every country household advantageously employ the time thus given them and strive, by their zeal and industry, to make amends for the usually limited advantages they enjoy for mental and social culture. Activity is the normal condition, not only of the body, but of the mind. Very few young persons are of such sluggish, mental temperament, as to be entirely insensible to the pleasures to be derived from the exercise of the intellectual faculties, while the majority of them have a natural and innate desire for such enjoyments.

Away from the city, the country bar or other store-room is too often the resort of young persons, who might employ their time much more profitably than in listening to the rude joke, coarse witticism, and tedious story, which always find attentive appreciators in such places. The fact that they will sit for hours and eagerly hearken to the recital of such things, in evidence that they could interest themselves in something better, were proper influences used to effect such a result. The question then arises, cannot home be made sufficiently attractive to induce them to discontinue their visits to such unprofitable resorts? We think so. If parents (we speak only of the country) would only interest themselves a little more in the educational welfare of their children, provide them with books, newspapers, periodicals, &c., and encourage them to read them, a desire for knowledge would gradually grow upon them, till at last their minds would become engrossed in the new and substantial delights of learning, and their former associates be renounced as unfit companions for social intercourse.

The fires of knewledge once lighted are not easily quenched; as the flames grew stronger, heavier fuel would be required. The long evenings of winter would be devoted to study and improvement, everything not perfectly understood would be investigated, nature's acquaintance would be more closely cultivated; her beautiful process of growth and decay would be watched and wondered at, and farm life be regard d as something more than mere manual in drudgery. Agriculture would be known a *science* worthy the attention of the weightiest minds. But are these things so? We fear not. Here, then, is a wide field for reform. It has even now, we are happy to say, many noble workers in it. But the harvest is very, very heavy, which makes the reapers seem fewer.

The farmer himself must be a prime mover in this direction. He must look to the manner in which his children spend their leisure moments; he must teach them to love to acquire an intimacy with the pleasures of intellect. Set them to learning something sensible, no matter what, since the direct tendency of all research and study is to elevate and refine the man and mind, and lead to further desire to taste the waters that flow from the fountain of truth. He must make them not theoretical, but practical philosophers; he must not sit nor sing drowsily before the kitchen fire, neither knowing nor caring that his sons are taking their initiatory lesson in tobacco chewing at some dirty bar-room, and his daughters stitching lazily at some garment that could be made much more cheaply by the sewing machine he thought was good economy not to purchase, although in a short time his boys will send double the sum off in cigar smoke that would be required to buy, not only a sewing machine but a dozen other conveniences needed by his family. His children may not be very profound or erudite, but they will be very far from superficial, and with principles of perseverance and uprightness incorporated in their characters, the true man and woman may by hidden by the, perhaps rough exterior. We repeat it, the farmer himself must be the agent in whose trust the responsibility for inaugurting such a revolution lies. He must effect his own regeneration, and establish his claims to respectability by his own unaided efforts. And the first step taken should show him, that not only charity, but other things, may begin at home, and that the tallow candle burning in the very centre of the family circle may light the way to as

glorious deeds as the glare of gas from the proudest Senate chamber.

Farmers, look to the winter evenings. We half believe they were made expressly for you, and if such is the case, you certainly should improve them to your utmost. With an intelligent, unprejudiced yeomanry holding the balance of home political power, our country need have no fear for her present or her future, and no class of men could be found more willing to perform the duties, or more worthy of sharing the privileges of Canadian citizenship.

HOW IS A MAN TO LEARN FARMING?

JUST as he would acquire any other art or profession: *by serving an apprenticeship to it.* This is really the only safe answer to the question. If Agricultsural education be not practical, neither is it profitable. Of course we do not call it useless—no addition to mental wealth is ever altogether useless—but it stops short of the point where, in ordinary language, it can be turned to *use*. What do young men go Colleges of Agriculture for? It is that they may there learn how to make a livelihood and income by farming. But if the education they receive be not practical, it will not enable them to reach this end. The student of Agriculture may have acquired a knowledge of the general principles involved in his profession, but, until he has learned the art, this knowledge can not guide aright. And a graduate of either the Highland Society's examinations, or those of the Royal Agricultural College, who has not added practical knowledge to his sciences, will only bring his diploma to contempt. These, it may be said, are mere assertions; but examples in abundance of the insufficiency of more general and scientific knowledge can be cited in illustration of their accuracy.

No one is less likely than the present writer to contend for a regard to agriculture exclusively as a money-making routine of operations. Let us admit it cordially and gratefully as "the art of all the sciences," affording, in its intelligent prosecution, scope for the exercise and enjoyment of the whole nature of man. The farm is no mere field for dull routine; it is the platform on which the best minds of the day are successively devoting their best energies. We must not, however, forget that agriculture *is* a routine of operations; and unless a man knows how each is to be performed, he is not an agriculturist. Instruction in the details of farm practice is thus an essential part of agricultural education; and unless our agricultural colleges take jealous and especial care of this, the agricultural degree which they confer upon their finished students will prove, agriculturally, worthless.

Suppose the case, which is not impossible unless this care be taken, of a farmer writing "M. R. A. C." after his name who can not "make his rent!" That would be an awkward thing for the institution which has passed him. *It* would of course become the laughing stock of those whose respect it especially desires to gain. And what would be the effect on *him?* Where the pride with which his diploma was received?

"You professed," we imagine him addressing the authorities, "to have done all that your institution could for me I was competent, in your judgment, as an agriculturist. I had answered all your questions, and you made me a member of your body, and sent me out with your diploma, prepared to take a farm, and expecting, as I believed you, to prosper on it. I found myself incompetent. Your chemistry and botany, and your agricultural lecture were insufficient. I had not learned from you how nor when to give my orders, either in the field or in the homestead; nor did I know when they had been properly and sufficiently obeyed. Your diploma has been worthless to me. My confidence in it has resulted in all this loss and waste. My son shall seek *his* qualifications as an agriculturist at the hands of a working farmer. He shall never blame me for sending him where only the sciences are taught, where practical instruction is considered comparatively unimportant, or in any degree inferior in rank or value, where the result on every student's future farm at harvest time is not kept in view as at the end and test of his instructions, by every teacher in the place." And this is not the language of angry disappointment. It is, we presume, the language of true and sober judgment.

The man whose agricultural instructions we should seek must be *first* an energetic and successful farmer. And next, he must have such a knowledge of the sciences as enables him to recognize in every fact he witnesses upon his farm the illustration of a general law. What a magnificent agency for agricultural education must that institution be where every phase and side of this man's professional ability and character is especially exhibited by a separate professor;

where every item of the qualifications he possesses is represented by a teacher who has directed his life-long attention to just that particular point; and where, over all these, is the commanding harmonizing influence of the Christian gentleman. In such an institution agricultural students are sure in every way to prosper, and genuine agricultural education is certain to be given and received.

But this will never be unless here, as in the instance of our representative teacher, practical agriculture shall occupy the leading place, and successful farm management shall prove the efficiency of the practical instruction given.

If instruction in the sciences in such an institution be regarded as the end for which it was established—if proficiency in them alone gives rank, consideration and position—if sound practical intelligence and ability in the field (the leading qualification of our representative teacher) shall come to be regarded as conferring only second-rate position and inferior rank—if the farm and farming shall ever come to occupy the second place in the estimation of the teachers and pupils—if the place shall ever thus *degenerate*, as we should say, to be either a lounge is or gymnasium, as it may happen, for mere students of the sciences, then its agricultural influence and value will have gone—it will certainly and quickly fall. And in the interest of English agriculture, which will want something useful in its place we confidenly say—*the sooner the better.*

CATECHISM OF AGRICULTURAL CHEMISTRY AND GEOLOGY.

Q. What is agriculture?

A. Agriculture is the art of cultivating the soil.

Q. What is the object of the farmer is cultivating the soil?

A. The object of the farmer in cultivating the soil is, to raise the largest crops at the smallest costs, and with the least injury to the land.

Q. What ought the farmer especially to know in order that he may attain this object?

A. The farmer ought especially to know the nature of the crops he raises, of the land on which they grow, and of the manures which he applies to the land.

I.—Of the Nature of the Crops he Raises.

Q. Of what parts do all vegetable substances consist?

A. All vegetable substances consist of two parts, one which burns away in the fire, called the organic part, and one which does not burn, called the inorganic part.

Q. Which of these two is the greater in quantity?

A. In all vegetable substances, the organic part is very much the greater. It forms from 90 to 99 out of every 100 lbs. of their weight.

Q. Of what elementary bodies does the organic part of plants consist?

A. The organic part of plants consist of four elementary bodies, known by the names of carbon, hydrogen, oxygen, and nitrogen.

Q. What is carbon?

A. Carbon is a solid substance, usually of black color, which has no taste or smell, and burns more or less readily in the fire. Wood-charcoal, lampblack, coak, blacklead, and the diamond, are varieties of carbon.

Q. What is hydrogen?

A. Hydrogen is a kind of air or gas which burns in the air as coal gas does, but in which a candle will not burn, nor an animal live, and which, after being mixed with common air, explodes when it is brought near the flame of a candle. It is also the lightest of all known substances.

Q. What is oxygen?

A. Oxygen is also a kind of air in which a candle burns with great brilliancy, in which animals can also live, and which is heavier than hydrogen or common air. It forms one-fifth of the bulk of the air we breathe.

Q. What is nitrogen?

A. Nitrogen is also a kind of air differing from both the other two. Like hydrogen, a taper will not burn nor will an animal live in it, but, unlike hydrogen, it will itself not burn, and therefore does not take fire when brought near the flame of a candle. It is a little lighter than atmospheric air, of which it forms four-fifths of the bulk.

Q. Do all vegetable substances contain these four elementary bodies?

A. No, the greater number contain only three, viz.: carbon, hydrogen, and oxygen.

Q. Name some of the more common substances which contain only these three?

A. Starch, gum, sugar, the fibre of wood, oils, and fats, contain only these three elements.

Q. Of what substance does the inorganic part of the plant consist?

A. The inorganic part of plants contains from eight to ten different substances, namely: potash, soda, lime, magnesia, oxide of

manganese, silica, chlorine, sulphuric acid, or oil of vitriol, and phosphoric acid.

Q. What is potash?

A. The common potash of the shops is a white powder, which has a peculiar taste, called an alkaline taste, and which becomes moist, and at last runs to a liquid when exposed for a length of time to the air. It is obtained by washing wood ashes (the ashes left by wood when it is burned,) with water, and afterwards boiling the liquid to dryness.

Q. What is soda?

A. The common soda of the shops is a glassy or crystallized substance which has also an alkaline taste, but which, unlike potash, becomes dry and powdery by being exposed to the air. It is manufactured from sea salt.

Q. What is lime?

A. Lime or quick-lime is a white, earthy substance which is obtained by burning common limestone in a lime kiln. It has a slightly burning taste, and becomes hot, and slakes when water is poured upon it.

Q. What is magnesia?

A. Magnesia is the white powder sold in the shops under the name of calcined magnesia. It has scarcely any taste, and is extracted from sea water and from some kinds of limestone rock called magnesia limestones.

Q. What is iron?

A. Iron is a hard bluish gray metal, which is manufactured in large quantities at our iron-works, and is used for a great variety of useful purposes.

Q. What is oxide of iron?

A. When polished iron is exposed to the air it gradually becomes covered with rust. This rust consists of the metal iron, and of the gas oxygen which the iron has extracted from the air, and hence it is called oxide of iron.

Q. What is oxide of manganese?

A. Oxide of manganese is a substance very much like oxide of iron, which occurs in soils and plants, usually in very small quantities.

Q. What is silica?

A. Silica is the name given by chemists to the substance of flint, of rock-crystal, and of sand-stones.

Q. What is chlorine?

A. Chlorine is a kind of air which has a greenish-yellow colour, and a strong suffocating smell. A taper burns in it with a dull smoky flame. It exists in common salt in large quantity.

Q. What is sulphuric acid or oil of vitriol?

A. Sulphuric acid or oil of vitriol is a very sour, burning, oily liquid, which is manufactured from burning sulphur (brimstone). It exists in common gypsum, in alum, and in Glauber and Epsom salts.

Q. What is phosphoric acid?

A. Phosphoric acid is also a very sour substance, which is formed by burning phosporus in the air. It exists in large quantity in the bones of animals.

Q. Are all those substances to be found in the inorganic parts of plants?

A. Yes, they are to be found in the ash of all our usually cultivated plants.

Q. Do all have the same quantity of ash when burned?

A. No. Some leave much more ash than others. Thus 100 pounds of hay may leave 9 or 10 pounds of ash, while 100 pounds of wheat leave less than 2 pounds of ash.

Q. Does the ash of different plants contain all these substances in the same proportion?

A. No. They exist in different proportions in the ash of different plants—the ash of wheat, for example, contains more phosphoric acid than that of hay, while that of hay contains more lime than the ash of wheat.—*James F. W. Johnson, M.A.*

A BRAZILIAN FOREST.

We often read in books of Travels of the silence and gloom of the Brazilian forests; some of which extend unbroken for many hundreds of miles in all directions. They are realities, the impression of which deepens on a longer acquaintance. The few sounds of birds are of that pensive or mysterious character which intensifies the feeling of solitude, rather than imparts a sense of life and cheerfulness. Sometimes, in the midst of the stillness, a sudden yell or scream will startle one; this comes from some defenceless fruit-eating animal, which is pounced upon by a tiger-cat or stealthy boa-constrictor. Morning and evening the howling monkeys make a most fearful and harrowing noise, under which it is difficult to keep up one's buoyancy of spirit. The feeling of inhospitable wildness which the forest is calculated to inspire is increased ten-fold under this fearful uproar. Often, even in the s till hours of midday, a sudden crash will be heard resounding afar through the wilderness, as some great bough or entire tree

falls to the ground. There are, besides, many sounds which it is impossible to account for. I found the natives generally as much at a loss in this respect as myself. Sometimes a sound is heard like the clang of an iron bar against a hard, hollow tree, or a piercing cry rends the air; these are not repeated, and the succeeding silence tends to heighten the unpleasant impression which they make on the mind. With the natives it is always the Curupira, the wild man or the spirit of the forest, which produces all noises they are unable to explain. Myths are the rude theories which mankind, in the infancy of knowledge, invent to explain natural phenomena. The Curupira is a *mysterious being, whose attributes are* uncertain, for they vary according to locality. Sometimes he is described as a kind of orang-outang, being covered with long, shaggy hair, and living in trees. At others he is said to have cloven feet, and a bright red face. He sometimes comes down to the rocas to steal the mandioca.—*Bates.*

FARM OPERATIONS.

FARM WORK FOR DECEMBER.

THE labors of the season having been devoted to the raising of crops the period of the consumption has now arrived. As it is important, on the score of economy, to raise heavy crops, so it is equally important now to study the most economical modes of feeding. 1. The first point of economy is to prevent loss by good and comfortable shelter. Exposure to freezing winds not only injures the growth and thrift of animals, but requires a greater amount of food to maintain animal heat. Sometimes the loss of animals, by death alone, toward spring, is greater than the cost of ample shelter. 2. The second is to feed regularly, that no loss of flesh may be occasioned by impatient fretting. 3. The third is to give the food in the best condition. Hay and stalks should be bright, and not musty. Cornstalks will go much farther if cut before feeding; but they should be cut very short, or less than a quarter of an inch in length, so as to be fine like chaff; this can only be accomplished by horse-power; it rarely, or never pays, to cut fodder by hand. Grain should be ground wherever practicable, for animals of whatever kind.

Straw should be carefully saved, even when raised in large quantities, as it has so many uses. It may be employed largely in feeding animals, if a little grain or meal is fed to them, regularly, at the same time. It may be largely used as litter, and converted into manure. It forms an excellent covering for large heaps of roots in winter, whether in root cellars or more exposed. It may be employed as a cover for temporary sheds for protecting cattle and sheep. In most cases the best way to manage straw is to thrash the grain as the straw is needed through winter, by means of a two-horse endless chain power, which requires but few hands in attendance. If thrashed with a larger machine care should be taken to save the straw from injury; if bound in bundles, as it is thrashed, it may be more readily handled. The best way to do this is to twist previously a large quantity of straw bands which may be done with a hook and handle. These bands, if twisted of slightly moist oat straw, will preserve their twist as soon as dry, and may be cut up into any desired length. When the threshing is performed, place a straw band so that the straw may fall upon it, drawing it into a compact heap, and when large enough, bind it. As soon as the binding is commenced, let a second hand place another band, and proceed as the first has done. In this way two men will bind all the straw that is thrown out of the largest size machine.

Ventilation.

This is important for all animals—horses, cattle, or swine. Foul air, drawn into the lungs' can not fail to injure its delicate coatings, and destroys, more or less, the health of the animal. Many farmers have decided against stables, because of the injury from dirt and bad air. Keep them well littered at all times, and let them breathe a pure air, and a different report will be made. But another opposite evil must be also avoided. Cold currents of air, sweeping through cracks, are sometimes nearly as bad as open exposure, and for this reason some farmers have concluded that exposure is best, after all.

Sheep.

Large flocks should be separated into portions of about fifty each, in separate pens in the shed, placing the stronger in one pen

the weakest in another, each portion being as nearly equal in strength and vigor as possible. Sheep always do best if fed some grain through the winter, commencing with a very small quantity at first, and gradually increasing as the winter advances. Caution in beginning to feed lambs in small quantities is particularly important. An average of a pint of corn a day is sufficient for full-grown sheep—half that for lambs. A good time is to feed them grain at noon, and fodder night and morning.

Colts and Young Horses

do well on straw, with a little grain. An excellent way is to cut oats in the sheaf an inch or two long, and feed the whole, grain and straw together.

Good Water

should be provided at all times for all domestic animals, and should be supplied to them frequently and regularly, at their pleasure. Depriving them of drink for a long time, and then allowing them to drink too much, is detrimental to the best thrift.

Manure.

The largest and best stables have a central alley passing through them, wide enough for a wagon or horse-cart to pass and carry out the daily cleanings of the stalls. Smaller stables may be cleaned by wheeling the manure out daily by hand. There are different modes of managing manure in winter—if not very strawy, it may be drawn at once and spread over the fields. On grass land thus treated it will produce a much better effect than if applied in spring, the rain soaking the soluble portions well into the soil and among the roots, an equally good effect is produced if the sod is to be plowed for corn. No fear need be entertained of the manure washing away, except in the beds of streams, as the soil, as soon as thawed, and especially if of a loamy or clayey nature, instantly absorbs the soluble manure. If the manure is quite strawy, it should be placed in large square piles, that it may rot down; and when the central portion is decayed, the edges should be cut down with a hay-knife and thrown on the top. Manure containing little fibre, or litter, should be kept under shelter to prevent waste, but coarse and strawy manure should be exposed to rains to hasten decay. Muck which has been shoveled out and dried last summer, may now be drawn and applied to yards and manure heaps.

Feeding Racks,

to prevent the waste of fodder, should be provided for all animals. Stock should be regularly salted, if they have a constant supply, they will eat but a little at a time.

Salt Troughs

for yarded animals are easily made by taking pieces of thick slab, say a foot long, and boring with a large auger or making a mortise nearly through on the rounded side. These holes contain the salt, and the troughs lying on the ground, can not be overturned.

Running out of Fodder.

Some farmers seem scarcely to know how they will be likely to come out in spring with a supply of fodder for their animals, and know of no better way than guessing. They should be more accurate, and determine by calculation early in winter what their supplies may be. If they have not kept a record of the number of tuns of hay, it may be determined with considerable accuracy by allowing five hundred cubic feet per tun of good, compactly pressed timothy, in the lower part of the stack or mow, and six to seven hundred in the upper part, or of clover. Then, allowing two and a half or three pounds daily to each hundred weight of animal, an accurate result may be nearly reached, varying in localities where the winter is long or short.

Manuring Wheat.

Where manuring wheat has not yet been applied by top dressing in autumn, either at the time or subsequent to sowing, it may be spread to greater advantage whenever the ground is frozen hard, so as to bear the wagon, and taking the precaution to use such fine manure as may be thinly and evenly spread. This coating of manure will also insure and accelerate the growth of the young clover in spring.

General Suggestions.

Be careful to keep cattle and other animals from meadows and pasture when the ground is soft, that they may not spoil the turf. Pick over apples in the cellar, and remove the decayed ones. Provide good dry fuel for the kitchen. Balance accounts for the season, and observe what operations in farming have been most profitable. Get up club meetings for evening discussions of agricultural subjects. Study the success and failures of other farmers, by taking a good Agricultural paper.

The famous trotting mare "California Damsel" has been recently bought by Mr. Sprague, brother of Gov. Sprague of Rhode Island, for $11,000.

PROPERTIES OF BONE-DUST.

AS bone dust has recently taken a strong hold upon the affections of our farmers, as it properly should long since, the following extract from Liebig, in regard to its properties and value, is interesting:

Among the neutral phosphates bone-dust holds the first rank. When bones are exposed, under high pressure, to the action of steam, they close their toughness, and swell up to a soft gelatinous mass, which, after drying, may be readily ground to a fine powder. In this form it spreads, with great rapidity, through the soil; it dissolves in water to a small but perceptible extent, without requiring the presence of any other solvent. What dissolves, under these circumstances, in water, is a combination of gelatine with phosphate of lime, which is not decomposed by the arable earth, and therefore penetrates deep into the ground—a property wanting in the superphosphate. In the moist ground, however, the gelatine speedily putrefies, being converted into ammonia compounds, and the phosphate of lime is then retained by the arable earth. Bone dust is the agent best adapted to supply phosphate of lime to the deeper layers of the arable soil, for which purpose the superphosphates are not suitable. Bone-earth, or burn-ash, is the name applied to bones freed, by calcination, from the glue or gelatinous part. The animal charcoal of sugar refineries belongs to this category. It must be reduced to the finest powder to render it fully available for manuring purposes. To effect its more speedy distribution through the soil, the presence of a decaying organic substance is necessary to supply the carbonic acid required for its solution in rain water. An excellent way is to mix the powder with farm-yard manure and let the mixture ferment. Among the phosphates of commerce, the guano coming from the Baker and Jarvis Islands are distinguished, before others, by their acid reaction and greater solubility. They contain only a small quantity of an azotised substance, no uric acid, and small proportions of nitric acid, potash, magnesia, and ammonia. The Baker guano contains as much as 80 per cent., the Jarvis guano 33 or 34 per cent. of phosphate of lime; the latter having, besides 44 per cent. of gypsum. In diffusibility, these guanos, when equally finely powdered, approach nearest to bone-dust: their condition also enables the farmer who wishes to accelerate their action, to convert them most readily into superphosphates (100 parts by weight of Baker guano require 20 to 25 per cent. of concentrated, or 39 to 40 per cent. of the lead chamber sulphuric acid.)

The influence of these neutral phosphates upon the produce of the field is generally less marked the first than in the following years, as it takes a certain time to effect their diffusion through the soil. The speedier or slower manifestation of their action upon a field depends, in a great measure, upon the state of fineness of the powder to which they have been reduced, the greater or less porosity of the soil, the presence in it of decaying matters, and careful tillage; but, under any circumstances, they require a certain store of soluble silicic acid, and of soda and potash in the soil.

STRAW FOR FODDER.

IN a recent conversation with John Johnston, and speaking of his success as a farmer, he remarked: "I should have made more money if I had found out the value of straw for fodder fifteen years earlier."

There can be no doubt that if wheat, barley or oats are cut before they are ripe, the straw, when cured without rain, makes valuable fodder. Chemical analyses and practical experience alike show this to be true. But if the grain is allowed to get dead ripe, or if it is much exposed to rains, there is little more nutriment in the straw than in saw-dust!

We have always been of the opinion that American farmers *think too much of straw!* They feed too much straw and too little grain. When grain and hay are as high as they are at present, there is a great temptation to sell all that can be spared, and to depend on straw to carry the stock through the winter. Those who do so make a great mistake.

We suspect that what Mr. Johnston meant was, that he would have done better had he discovered sooner the benefit of cutting grain earlier and securing the straw in good order, and then feeding it out in connection with oil-cake, corn, and buckwheat meal, &c. In this way he would have saved a large amount of hay, and been enabled to winter more cattle and sheep. In this he was undoubtedly right. He owes his remarkable success as a farmer, in a great degree, to his practice of feeding so many sheep and cattle in winter—and feeding them well. He has fed out on his

farm hundreds of tuns of oil-cake and thousands of bushels of corn. He has raised as much as two thousand bushels of corn in a year, but *never sold a bushel!* He has made his farm one of the richest and most productive in the State, but it has not been done by feeding straw. He is careful to preserve and feed out his straw, but by no means depends on this alone. Straw fed in connection with grain is excellent, but straw alone will starve the cattle and starve the land—and in the end starve the farmer also.

That there is great difference in the value of straw has been fully shown by the analyses of Dr. Voelcker, Dr. Anderson, and other chemists. Both these gentlemen found that wheat, barley and oat straw, when the grain was not cut until dead ripe, was not *half as nutritious* as that cut when ripe; and when the grain was cut before it was ripe—as it may be without loss—the difference was still greater. For instance, Dr. Voelcker analyzed three samples of straw, one "green," another "fairly ripe," and the third "over ripe." Of soluble protein compounds, the green straw contained when dry, 6.56, the ripe 3.13, and the over-ripe 1.54 per cent.; of sugar, gum, mucilage and extractive matters, the green contained 19.08, the ripe 12.59, and the over-ripe 3.79 per cent. The total per centage of nitrogen in the dry straw was: green, 162; ripe, 0.76; over-ripe, 0.68.

These are very remarkable results. The amount of protein or flesh-forming compounds in *green oat straw* is as large as in ordinary meadow hay. The greater portion of this matter, too, is found in a soluble condition, and would therefore be easily digested. As the straw approaches maturity, this nitrogenized matter dwindles down to less than one-half.

Of sugar, gum, and other matters soluble in water, not less than 19 per cent. are found in the green straw, against less than 4 per cent. in the over-ripe straw. These are the most valuable nutritive constituents, and the results show that the straw of oats cut green is *four times as nutritious as that allowed to get over-ripe*. The sugar, &c., of the straw is turned into indigestible woody fibre. The green straw contains only 25 per cent. of this substance, while the fairly ripe straw contains 32, and the over-ripe 42 per cent. of this indigestible matter.

Pea-haulm is the most nutritious of all straw. It contains 14 per cent. of soluble matter, 1½ per cent. of nitrogen, and over 2½ per cent. of oil. It approximates more closely in composition and value to hay than any other straw. It should never be wasted.—*Gen. Far.*

BARN-YARD MANURE.

HAVING been a constant reader of your journal for some time past, during which interval I have been much benefitted by the many and valuable articles I have read on all subjects pertaining to Agriculture, seeing that you are at all times willing to insert in your paper information that may benefit your readers, I offer this as an excuse for encroaching with a simple statement of what I have witnessed on a friend's farm in New-Jersey, or rather his method of *composting manures* produced on his place. There is not the care given this subject that there ought to be; for the manure heap to the farmer is his reserve guard, and if this fail in fulfilling its duties, he must fail also.

The general practice of farmers throughout the country, of pitching the manure from their stables and cow-sheds, into the open barn-yard, exposed to the rains, which wash more or less of its soluble inorganic constituents away, besides subjecting it to the rays of the sun, causing an immense loss by evaporation, and also allowing the organic gases, carbonic acid, ammonia, etc., which are generated during decomposition or fermentation, to escape, is a most negligent and careless way of doing things, and opposed to all true economy, for he loses the most valuable part of his manures. Near my friend's barn is a long shed, constructed of common boards. The manure from the stable and cow-sheds is removed to this shed every morning. When five or six inches in thickness, a layer of pond mud or muck is added to the mass. This prevents the escape of any gases that may be liberated during decomposition, by absorbing and retaining them. The whole heap consists of alternate layers of barn-yard manure and pond mud. The stalls are so constructed that the liquid drainage passes into a deep recess made on purpose, along side of the manure heap, and from there it is thrown over the compost once and sometimes twice a week. In case the liquids from the stable and sheds are insufficient, the requisite quantity is added from a large cistern near the shed. The liquid prevents all fire-fanging or burning of the manure, causing the labor of forking over to be en-

tirely dispensed with; this alone is quite an item saved. During my visit in the spring I had a chance to witness the appearance of the manure, as it was carted out from the shed, and it looked to me more like rotten cheese than barn-yard manure. Every particle seemed to have thoroughly rotted, and not a vestige of straw could be discerned in the entire heap.—E. C. E., *in Country Gent.*

BREEDERS' DEPARTMENT.

POULTRY IN FROSTY WEATHER.

THERE is something exhilarating in frost. When the early morning breaks on the earth covered with rime, and the hard ground seems to spurn the foot that treads on it, and the sun rises like a disc of burning copper, there is something cheerful about it. Nature has donned her masquerade dress of white. Your horse cannot contain himself; and the steady old friend for some months past, content to shake his head or whisk his tail, as the only answer to what a grand-daughter of ours calls "a good cut o' the whip," now seeks to devour space, and to try conclusions with your strength or that of your reins. In like manner, your tried friend, the old dog, gambols, and in the gleesomeness of his feelings, he picks up a shred of cloth in the field, and shakes and tosses it for very wantonness. The appearance of real winter is then a holiday for many, but (ah! those *buts*) not to all. It is none to the poultry. Water is frozen; the ground is so hard they cannot scratch; there is not an animal of any kind on its surface; and they must depend on their owner for everything they want. See they lack nothing. First, they must have water. Few people have any idea of the suffering caused to birds by the lack of water. Their power of maintaining life on the smallest possible quantity of food is wonderful, provided they have water; but a practised eye can tell in a dead fowl or pigeon whether it suffered or not from thirst. The skin becomes hard, dry and red; the flesh contracts, as it were, and becomes brown, and the whole body looks as if it had been suddenly shrivelled or dried up. You must bear in mind they require more food and better than they do in milder weather; and if you can, let them have a greater variety. They want substitutes for the worms and insects. Now, the scraps of meat and fat from the table should go to the fowls. Save the drainings of all glasses, pour them together, and sweep all the crumbs and odd corners of bread into it. Feed the birds often, and, if there is snow, sweep a clean place and feed there. Never feed any kind of bird in such a manner that they shall pick up snow with their food; it is a strong medicine to them. The lark that fattens in two days on the white hoar frost becomes a wretched skeleton after two day's snow.—*Cottage Gardener.*

STOCK KEEPING.

BUT, Mr. Mechi, how do you manage to keep so much stock on 170 acres? I see that you have 70 head of bullock and cow stock, young and old, and 100 sheep, besides pigs, all in a growing 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 to myself by practical farmers who visit my farm, that I propose 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 mangel.

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 trench-plowed, and three acres planted at 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 ray-grass, half first year, half second year's growth.

Seven acres of grass land, fed to 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, mangel, 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 of scouring, and they grow rapidly. When water or hoar frost stands on the rape it is brushed off with a long pole before the lambs go on it. Our calves feeding out of doors on old Italian ray-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 ray-grass cut by the chaff-cutter, cotton cake, bran and malt combs; or in September, October, and November, turnips or mangel (with the tops) pulped, cabbage tops 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 £500 on 170 acres. This consumed by my animals leaves manure enough to compensate for the wheat and barley sold off the farm, thus preserving and increasing the fertility of my soil and the bulk of my crops. There is nothing that pays better in the manure than cotton 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 much 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. Horsefall) gives us materials for fattening cheaper than any other food.

I am indebted to my sewage irrigation for a very heavy crop of Italian ray-grass, one acre of which, during the summer, will keep all my bullock stock and farm horses for a week: six acres keep 100 sheep from March until September. Italian ray-grass cannot be grown in summer without plenty of fluid. I find irrigating with farm sewage 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 the proper proportions. No one has explained this more clearly than Mr. Horsefall, in his two able papers on dairy farming and meat making, in the Royal Agricultural Society's Journal, Vol 17 and 18.

In fact building up an animal is like building a house; you may have no end of bricks, timber and slate, but these are all useless without water, lime, sand and nails.

Immense sums are wasted in food, agriculturally, for want of a proper knowledge in this matter of suiting the mixture of foods to the requirements of the animals, whether for growth, fattening, or milk making. When practical farmers have acquired this knowledge they will no longer laugh at me for attaching much value to bean, wheat, and oat straw, as important feeding stuffs when properly prepared.

To sum up, it is by the extensive use of most of my straw as food, aided by important foods, and especially by consuming rather than treading down my green crops, also by giving each animal a limited and comparatively small quantity of roots or green crops, that I am enabled to keep much stock, make much manure, and grow much corn. J. J. MECHI in *Irish Farmer's Gazette*.

SHEEP AS FERTILIZERS.

JOHN E. Traver, of Dutchess County, N. Y., writes on this subject as follows:

I keep a flock of thirty sheep, which have had the range of an eight acre lot. The soil of this was thin, as it was situated at some distance from the barn-yard, and had received no manure from that source. In the summer of 1858, the dogs got among my sheep and frightened them so they would not go on the back side of the lot, unless it was to feed a short time, and lay wholly on the

other side of the field. I planted it with corn after it had lain two years. The side of the lot where the sheep had rested gave a good yield, and the worms did not trouble it throughout the season. Where the sheep did not lay, but only fed, the worms made sad havoc and the corn was poor. The oat crop that followed showed some difference. On the rye I did not see much inequality. My opinion is that if we keep more sheep, our crops will not be so much molested with worms This statement is worthy the consideration of our farmers.

REMARKS.—Several years ago we kept a small flock of sheep in the state of Connecticut.—These sheep were accustomed to frequent a steep side-hill lot in the vicinity of the barn, having been thoroughly frightened from the rest of the farm by the dogs; and although the lot has never been worth the expense of mowing it, and was not good for much as pasture, the first season after we had given it up to the sheep, the young grass started so thriftily that we mowed the lot and it yielded two tons of grass to the acre for two years in succession. We consider sheep exceedingly valuable for restoring a farm to fertility. The hills of Connecticut and of other States, ought to be covered with them.—*Working Farmer.*

FEEDING OATS TO HORSES.

A Correspondent of the *Rural Register* gives his experience as follows, on feeding horses. He says:—"the same quantity of oats given to a horse produces different effects according to the time they are administered. There is, decidedly, a great avantage in giving horses water before corn, and an injury in giving water after corn. There is a bad habit prevalent, namely, that of giving corn and hay on their return to the stable after hard work.—Being very hungry, they devour it eagerly and do not masticate; the consequence is, it is not so well digested. When a horse returns from work, perspiring and out of breath, he should be allowed to rest for a time, then give a little hay, a half an hour afterward water, then oats. By this plan water may be given without risk of cold."

COOKED AND UNCOOKED FOOD.

In a communication from the Society of Shakers, at Lebanon, N. Y., in the Patent Office Report, is the following statement as to the relative value of ground and unground, cooked and uncooked corn, for feeding and fattening hogs, cattle, &c.:

"The experience of more than thirty years leads us to estimate ground corn at one-third higher than unground, as food for cattle, and especially in fattening pork; hence it has been the practice of our society for more than a quarter of a century to grind all our provender. The same experience induces us to put a higher value upon cooked than upon raw meal; and for fattening animals, swine particularly, we consider three of cooked equal to four bushels raw meal. Until within the last three or four years, our society fattened annually, for thirty years, from forty to fifty thousand pounds of pork, exclusive of lard and offal fat; and it is the constant practice to cook the meal, for which purpose six or seven potash kettles are used."

ON THE BREEDING OF HORSES.

THE following valuable article was prepared by Col. H. L. Shields, at the request of the managers of the Rensselaer County Agricultural Society:

In most dissertations upon this useful and indispensable animal, much space is devoted to describing the origin of the horse—the differences between the Darby and the Godolphin Arabian; how they were obtained, &c., &c., subjects, which, in our judgment, but little interest the breeder of the present day. We propose, therefore, briefly, to allude to those points in breeding, breaking, training, driving, and the general management of the horse, as shall equally interest all, who, either for business or pleasure, use this noble brute. Many of our farmers who yearly raise one or more colts, pay no attention whatever to the size, action, &c., of the mares, or stallions they make use of; and many men of business and pleasure who keep horses, knowing nothing of how their animals should be fed, groomed, driven and managed, leave all of these important considerations to the care and judgment of bipeds as ignorant as the brute himself, and far more unfeeling, thus causing heavy losses to owners from their own carelessness or ignorance. It will, therefore, be our aim to give in a brief space such hints as shall remedy this evil, to all those who will take the pains to peruse this article and remember its contents.—First, then, as to

Breeding.—Under this head it is well to consider the use for which the animal is

designed —whether for the road the coach, the course, or heavy draft. No animal is fitted for all these various purposes.

It is desirable that all horses should be of good color, dark bay, chestnut or brown, (with as few white marks as possible,) these colors being best, and indicating more constitution than the lighter colors. Small, lean heads, full eyes, long, tapering necks, sharp, deep shoulders, sloping well back, (for heavy draft some prefer the upright shoulders,) large in girth, broad loins, sinewy, flat legs, short from knee and hock to the foot, round, (barrel,) dark; good sized fee. are elements of beauty and usefulness to which none can object.

For the Road.—A horse should be about fifteen hands high, (a hand being four inches,) measured from the top of the withers or shoulders to the ground, when the horse stands naturally. His weight should be about 1000 pounds, for such weight in an animal fifteen hands high, in moderate flesh, indicates compactness and power *somewhere*. Experience has proved that horses of this size carry their weight better on long journeys, pound their feet less on pavements and hard roads, and are apt to be more fleet than those of a larger class, for while greater length and height will give an increased stride, either running or trotting, the power to gather rapidly, and especially for long distances, requires much greater muscular exertion in large than in small horses. from the greater weight to be propelled. Our fastest racers and trotters have generally been from this class—Eclipse and Fashion, Ethan Allen and Flora Temple, for example; such, then, are the horses for road, saddle or turf.

The *coach or family horse* should be of a larger class—say 15½ to 16½ hands high, and weigh from 1000 to 1200 pounds. Such animals, when combining style and beauty, command good, remunerative prices, and it is very questionable if they are not far more profitable to the breeder than the fleeter animals, which require much time for training to acquire the speed necessary to command high prices. The coach horse requires only gentle and perfect breaking—such as the farmer can give while performing his farm work, to command from $500 to $2000 the pair. To bring a like sum the road horse must show great speed—such as not one out of fifty attain, even after years of training—and if time is money, that consumed in training the trotter must be added to his cost. To ensure style, ease of action, intelligence and beauty, the coach horse should have a good strain of the *thoroughbred*, (animals with pedigrees tracing back to the English turf on part of sire and dam, although a term constantly misapplied when speaking of Morgans, Black Hawks, &c.,) and yet retaining enough of the cold blood to give him the heavy tail, mane, &c., never possessed by the thoroughbred horse. Our remarks about color and figure are all important in the coach horse.

The *draft horse* should be from 15 to 17 hands, and weigh from 1200 to 1500 pounds, with short legs, broad, short back, loins and chest, round, solid body, and capable of throwing great weight into the collar, of quiet, easy disposition, rather resembling the patient ox than the restless, nervous thorough-bred. These three breeds are distinct, and as well might we expect the greyhound, the St. Bernard and the terrier each to show the peculiarities of the other's separate natures, as to expect the racer to draw a heavy load of stone, or the clumsy draft horse to show 2:40 to a sulkey; and yet such has been the unreasonable expectation of many American farmers and breeders.

We will close our remarks on breeding describing our model of the brood mares and stallions. Both should be of good color and temper, their ancestry possessing for two generations the same good qualities, if possible—for animals often breed back to a white-faced, white-legged sire or grandsire, dam or grand-dam. There should be a *moderate proportion* of size maintained, the mare being rather the larger—but the great mistake of breeding a small mare to a very large stallion, and *vice versa*, will probably produce a monstrosity of a quadruped with the large head of one parent and the small body of the other. A reasonable proportion can rarely be realized. That by a judicious system of breeding horses can be brought to a larger or smaller size, none can doubt; but it should be done in a series of generations, never in one. The same remarks apply equally to gait. Cross a short, quick-stepping Morgan with a long-gaited thoroughbred, and you produce often a mongrel that has a medium length of step and no quickness. If like produces like in any point it should be in gait; but both parents should be gaited alike, never *extremely* dissimilar in this or any other respect. Shorten and quicken, or lengthen by degrees, in three, four or more genera-

tions. Especially should both parents be alike in points desirable to retain in the offspring. A brood mare should be roomy, a *good milker*, (for no foal can flourish where the dam gives it no food,) both sire and dam should be between 8 and 13 years old. If parents are older, their colts are puny-looking animals. Neither should they be overworked.—Hard training essentially impairs the powers of breeding, and hence so few of our renowned horses have left worthy successors. The mare should be kept steadily at breeding to develop all her qualities as a dam. First colts are rarely the equals of their successors.

Great mistakes are also often made by our farmers in selection of stallions. To save a few dollars for the services of the horse, they often breed to any inferior animal that presents himself, forgetting entirely that the colt from good stock will remunerate him fourfold for the extra cost of service; after which the expense for rearing a superior and inferior colt is the the same, and while one at five years old commands $500, the other will find slow sale at $125. In our judgment stallions should be elected by properly-appointed judges, and no others be allowed to serve mares. Two or three first-class stallions, of proper size, pedigree and action, in each county, would rapidly improve our stock, and would also remunerate their owners for the large outlay necessary to obtain them. In this respect Kentucky is fast outstripping Vermont, while the latter State has every advantage in its clear, cool, invigorating atmosphere, its sweet mountain herbage, while the rough ground over which the colt climbs in pursuit of food, develops every muscle, and gives him feet like flint and sinews of iron. In New York and Vermont, *thoroughbred* stallions of large size are needed to bring up gradually the size, courage and endurance of horses. To prove good stock-getters, stallions should be spared from the severe training necessary to develop speed. If of good ancestry and the necessary form, there can be little doubt of the animal's performance if trained. Hard driving takes from him the courage, fire and vigor which should mark the stallion, and even if a little vicious withal, it is no *material* objection in the sire. Very *amiable* horses rarely possess strong constitutions, while the vicious brute is always tough and hardy. Our stallions are often worked to earn their *living*, or trained to trot fast, as such animals only pay in the stud—many presuming that such must necessarily get trotters, while they forget that all the powers of the constitution are taxed to sustain the unmerciful driving to develop speed. The *figure* of the stallion should be closely inspected—short necks, big heads, light limbs, white face and feet, narrow loins, ringbones, curbs, spavins, &c., &c., are all *inheritable*. We yet hope to see the day when stallions will be owned by Agricultural Societies and used for the public good, thus avoiding the miserable degenerate race now infesting the country, and the extravagant prices demanded for the services of the few that are worthy.

Treatment of colts.

In the foregoing we gave some general principles of breeding. It is our purpose now to speak of the training and general management of horses. Farmers are apt to go to one of two extremes with their colts—either to halter them and drag them about through the heat of summer, on roads of all kinds alongside their dams at work, or else to turn them out to run wild during the first six months of their existence, out of sight and hearing of human beings. Now, we take exception to both these methods of proceeding: to the first, because the limbs and feet of the young animal are tender, and apt to be strained and bruised by being compelled to keep up with the dam, even when walking, for several consecutive miles The young colt requires frequent rest, and should be at liberty to lie down whenever inclination prompts. When the colt becomes tired it drags on its halter, straining the cords of the neck, back and legs. It is also disadvantageous to allow the young animal to run too long without subjection, for when the attempt is made he will resist with great force and often with injury. At the risk, then, of some extra work, we advise that the colt be accustomed to be handled often, until he has no fear to approach persons, and when they always receive caresses, they are very ready to do so. At two months old, put on the halter; but allow the colt to go very much as he likes, occasionally drawing him towards you and caressing him. In two hours you will have imperceptibly broken him to lead. Then, when you tie him, do so with a halter he cannot break—a short struggle will satisfy him he is conquered. Never suffer any one to strike or yell at a colt: one such barbarous act will cause a day's work to overcome its bad effect. When first cleaning him, avoid the head—

then approach that part tenderly, and if he resists, go to some other point. In a few moments return, and so continue till he submits with pleasure, rather, to being handled and rubbed anywhere and on any part. Your colt is then half broken. Wean the colt at five or six months old, first teaching him while suckling the mare to eat oats. When taken from the dam confine the colt closely, and put them out of hearing of each other for one week. During the *first* winter, feed daily two quarts of oats and all the hay the colt will eat. This, with good warm shelter, will keep him growing and improving. Don't turn out in spring till the weather is settled and warm, and a full bite of grass. The first year makes or ruins the colt. It is the most important of his life. Keep him *fat* the *first* year, whatever you do afterwards, for this year decides whether he is to be a full grown horse or a miserable pony—no after care can atone for neglect during the *first* twelve months. Good pasture (mountain if possible) the next season, and plenty of hay the next winter, with a quart of grain if convenient, will bring you a finely formed, powerful two-year old. If a horse, alter him early *before fly-time*, and turn to good grass. In the fall begin to break, bitting gradually tighter each day—within two weeks you have his head as high and graceful as nature allows. The neck should be arched and the face *vertical*, without constraint. When the bitting is accomplished, put on your harness and let the straps dangle around his legs; continue this until he pays no attention to them, but do not fatigue the colt neither in the bitting bridle or harness The bending in of the neck is exceedingly painful and should be done by degrees, the work requiring two weeks. While in the bitting bridle, exercise him on a circle to the right and left, alternately, the radius never less than 10 to 15 feet, otherwise he will learn to step too short. Make him walk and walk *fast* while walking; no gait is more important, and our Agricultural Society should offer premiums for fast walkers. While harnessed, accustom the colt to wagons, sulkies, &c., by running them around and about him. Then harness to the sulky and lead him several days until he no longer notices the pushing or jostling of the vehicle. Then let one get in while another leads, and so *gradually* get him accustomed to all around him; on finding he is not hurt he will soon become quiet.—Occasionally harness double with a steady, quiet horse, but put on no load. Teach him to back by standing in front and pressing on the bit—calling out "back," &c. *Always caress when he has done his duty.* During the second winter, hitch in double, making the other horse draw all the weight, and drive for a short distance; (say one-quarter of a mile at a time,) alternately, fast and slow. Train your colts to three gaits in harness, the fast walk always, the moderate or road gait for distance, and the rapid trot. As if we desired to make a man a good dancer, we would begin young while the limbs were nimble and the action graceful—so if we desire a fast walker and a fast trotter too, we must take the colt while young, and so when pressed, he will take up the fast trot instead of the gallop, so natural in after years. A horse can be trained that he is to trot and not break up, as well as the boy can that he is to glide but never jump in the waltz. We do not pretend that horses will learn to trot *equally* fast, more than all the boys will dance equally well, but all can be trained to exert every muscle in the trot, as well as in the run. Colts should never be driven fast for long distances; they become leg weary, and cut themselves or "interfere" as it is called. At three years old, the horse can perform very moderate work. At four, more still, but not until five, should he be expected to do a "day's work," and better yet if deferred until six; most horses are ruined *before* five, by early and injudicious driving or brutal treatment of some kind. The farmer can best use horses up to this age; all his work can be done by his brood mares and colts, and leave all his *matured* horses for market. One horse thus raised and trained is worth two such as we now often meet, and so the breeder's purse will prove who tries it.

Grooming and feeding horses.

A few words now about grooming and management. Every horse should be thoroughly cleaned each day. The bedding, instead of being thrown under his manger to fill his food. his eyes and his lungs with ammonia, should be thrown behind him, or out of doors to air. His manger should be *kept* clean and once a week washed with salt and water and salt left in it. One night in each week he should have a warm bran mash—eight quarts—generally given on Saturday night, as it is somewhat loosening and weakening, and the horse is presumed to be idle on Sunday. Oats are by far the best food, and ground oats wet with water

is better than whole dry grain. Cut hay is a great saving, and moistened and sprinkled with ground oats, forms *the best of food.* The hull of the oats is hard and often unmasticated, and passes undigested through the system, thus taking away instead of imparting strength and nutrition. For medium sized horses, with moderate work, nine to twelve quarts per day and fourteen pounds hay are ample. For large draft horses, eighteen quarts oats and sixteen pounds hay. Food consisting of one-third corn ground with two-third oats form strong, hearty, *winter* food for work or coach horses, but corn is unfit for road or *fast* horses. It is too heating. Goods beds and good grooming are as important as good feeding. Horses, like men, want good, dry, warm, clean beds. In grooming tie your horse so he can't bite his manger, and thus learn to crib-bite; and if you find your groom curriyng and tormenting the poor animal when tied, so he is uneasy and restless, use your stable broom over the groom's back—it is an excellent instructor to teach him to be gentle. Let the curry-comb be very moderately used on the body to loosen up the scurf and dirt, but never permit one near the mane and tail. *Rely mainly on the brush* and rough cloth for cleaning. Banish combs from your stable. They tear out more hair in a day than will grow in a month, and they ruin all the manes and tails that are ruined. The tail should be washed with castile soap and water once every week, and *brushed with a wet brush every day in the year,,* holding up the bone of the tail and brushing the hair from you. Half an hour is enough-for a good groom-to one horse, but one hour's time at the outside, ample to be very complete. City horses on dry floors should have cow manure put into their feet once a week, to draw out fever and keep hoofs growing. It should be put in over night and allowed to wear out of itself. To conclude, always be gentle about your horse's body, *especially his head*—" more haste less speed" is peculiarly applicable to grooming and breaking. Use whips as little as possible—use your reason, and exercise patience and kindness; and instil by precept and example the same useful lessons in these untutored creatures denominated grooms—and if you cannot inculcate wholesome truths into their heads, you can ameliorate the condition of that much abused animal, the horse, by occasionally exemplifying the power of their own treatment on themselves.

SHELTER FOR ANIMALS.

EVERY thing that tends to increase the profit of farming must directly or indirectly benefit the farmer by raising the value of his land. Every effect has its cause, and there are unfortunately so many preventible losses in agriculture, that I propose one by one to enumerate them.

Animals differ in no degree from ourselves in the appreciation of a dry bed and a dry skin, a warm corner in winter, and a cool one in summer. How imploringly will cattle and sheep stand at the field gate in bad weather, when they know there is shelter for them elsewhere. How quickly sheep will avail themselves of a wooden hurdle, a hard road, or even a wheelbarrow or a piece of board to lay upon, so as to avoid contact with the wet ground: to them damp sheets. It is a well known and admitted fact that a saving of one-third in food results from providing shelter when required. Add this gain, or deduct the 33 per cent. of loss over fifty-six millions of acres, with their tens of millions of animals; and you are astounded at the sum total.

Exposure, even in dry weather, to a sharp wind, abstracts an immense amount of caloric from the body, which must be made good by the fuel or fat of the food. Even with well-woolled sheep this takes place in degree, and it must interfere with their repose, for we cannot rest well when cold.

It is surprising how easily one may extemporize effective shelter. I find it undesirable to house animals and turn them out in the day; the extreme variation gives them cold. I therefore, after threshing my first wheat, stack the straw, thatch it ready for next harvest, place it on a pasture, surround it at some distance with hurdles, throw down a little straw close to the stack, and make this the night fold yard for my cattle. Here they get their cake, bran or dry food. Bullocks soon establish, by rubbing and grooming themselves, a comfortable arcade of straw on either side, or at each end, according to the wind. Under this they lie comfortably ensconced, free from driving rains or strong cold winds, and in the day time, weather permitting, go to their feeding ground.

The act of grooming themselves gives cleanliness, and stimulates circulation in

the skin, and pays well in the health and condition of the animals.

There is no currycomb or horse brush so effective as good strong reedy wheat straw, free from weeds, especially if you have trimmed or shaved the stack. Where reaping by hand is still the practice, a good haulm stack answers well. If farmers knew how cheaply a close shed or covered yard could be erected, and how much it influences and preserves the condition and buality of animals and manure, they would erect them.

I have such a shed, 57 feet long, 35 feet wide, the walls 8 feet high, a single span and space slated roof. This will accommodate 30 two-year old bullocks. I have at present in this shed 27 two-years old shorthorns. They appear closely packed, but have ample ventilation. It may be called the box system on a large scale.

The straw under them is invariably cut up by steam into two-inch lengths, and readily forms a homogeneous mass. It need not surprise us that strong reedy straw, so cut, readily absorbs urine, for in cutting it gets split and broken; thus the spongy inside of the straw at once absorbs, while the glassy exterior of uncut straw will not absorb. The cost of cutting it by steam power where an engine is on the premises is insignificant.

A dung-heap is thus quickly formed under the animal, free from destructive heating, which would take place with long uncut straw. Many an animal becomes lung diseased and destroyed by the fermenting masses in open farmyards, or even in covered yards, when the early spring sun and an increasing temperature cause heating and decomposition in the long-strawed and less condensed mass, more accessible to aeration than the homogeneous hodge-podge of chopped straw manure. Assuming that the animals are fed, as they ought to be, with cake, roots, meal, bran, and chaff, the dung from this shed, taken direct to the land, will give results that will put to shame the ordinary dung-heap, or even guano. It is always ready for use, and spares the cost and waste of a manure heap.

After a heavy crop of tares, I have now a fine crop of cabbage. As soon as the tares were removed, acre by acre, the shed manure was at once carted on, spread and ploughed in, and the cabbages planted in June. The t ench ploughing was very deep, by two horses in the top plough, four horses following in the same track with a second plough—making a thorough rough job of it—in stiff clay. This is the way to grow abundant food for your animals at small cost.—*Prof. Mechi*, England.

THE FLOCKS IN WINTER.

We have a correspondent in Cumberland county who is in love with sheep husbandry; and in a recent note says he wants us to "give an article every week on sheep." This correspondent makes numerous inquiries, which it will be impossible to answer in one article, and we accordingly give some suggestions on the first; reserving until another time the consideration of the remainder.

"Will you please give us through the *Farmer*, a chapter on the winter management of sheep, and particularly in regard to the use of apples and roots as a winter feed for them.

In the first place, it is necessary to have a good warm shed where the sheep can be put up at night and also during the inclement days of winter. This shed should be of sufficient size to hold the entire flock, so that in stormy weather they can be fed without being turned into the yard. If necessary, as it will be where flocks of considerable size are kept, the shed should be divided into separate apartments.—Again, the sheep should have a yard by themselves; they should never be allowed to run in yards with cattle, unless the flocks of both are very small. Feeding-racks should be provided both in the yards and sheds. Pure water, either from cistern or well, is also neccessary; for sheep as well as other stock, dislike to leave the yard for drink. The flocks should be fed regularly, i. e. about the same time in the morning and at night. The feed at noon may be varied according to circumstances. It may be given at noon; but if the weather is very severe, two feeds between the first and last may be given—while if it is very mild, the feed at noon can be altogether omitted. Some farmers contend that sheep usually have too much run given them in the winter, and that they will waste more of their fodder than if kept in close yards. But sheep require pure air; and we believe the flocks will be in better condition, if allowed the range of an ample yard, than if kept in close quarters. Sheep should not be kept in too large numbers together. The most experienced flock-masters with whom we have conversed upon the subject say, that at most not more than twenty-five should be kept in one yard or flock. It is also important that sheep of about the same weight be kept together; and in no case—except in very small flocks—should lambs or yearlings be allowed to run with full grown sheep. They are pushed away, and as a consequence get poor and sick.

We have never fed apples to sheep, but perhaps they may form a good provender. At any rate, our correspondent can easily determine the matter by feeding them to a certain number of sheep, and then changing them to roots or other provender and carefully noting the result.

We regard roots as a very valuable auxiliary to the proper keeping of sheep in winter; for we have found from our own experience that a feed of some kind of roots, once each day, is an

absolute benefit to the sheep, keeping them in good condition and providing a most suitable relief to the dry forage which is their constant feed. Barley, oats, corn, beans, and also corn and peas mixed, are good provender for sheep, although we think less of oats than of any of the others. Feeding a small amount of these each day will be found to pay better than it will to sell the grain, even at the present high prices.

FALL AND EARLY WINTER CARE OF SHEEP.

THERE is no season of the year when sheep are more liable to lose nearly all they have gained, than during the fall and early winter; and if they do, there is an end to the hopes of a crop of wool. For the want of food has the effect of stopping the growth of the wool, and the moment the growth is stopped, the end of the fibre is completed, a change takes place, it becomes dead, in a manner analaogous to the stem of ripe fruit, and a renewal of good feed after these months, and after the growth of the wool has been once stopped, only prepares the skin to send forth a new grow h that pushes off the old fleece, and causes it to be lost before shearing time. The cases are not unfrequent, when we have been told by the owners of flocks of sheep, which were shown in a very tattered condition in the spring, that they did not know what had got into their sheep, they "had fed them grain ever since February, or perhaps since New Year's;" it could not be poor feed that had caused the loss of the fleece. But in fact, the harm was done before New Year's. The sheep had been allowed to lose their condition n November and December, the growth of the fleece had been arrested, and the interior works of the skin that produced the pile of wool had been stopped for want of supplies. When the works were again set in motion by sufficient supply of food, they produced a new crop, which did not connect with the old one. Nothing is more evident from this than that the economy of the wool grower consists in keeping his sheep well fed during the early part of winter, and also well protected from storms; for it is plain from the fact that wool begins to grow even on poorly kept sheep, as soon as the temperature of spring permits the animal economy to divert some of the supplies from being consumed in keeping up the vital organization, to the increase of the fleece, that heat has as much to do with the growth of wool as with the growth of plants. Hence we say give sheep protection at an early date in the beginning of winter, if you desire to keep the fleece in full growth during the cold season.—*Michigan Farmer.*

HOW CHANGE OF SEX IS ACCOMPLISHED IN THE BEE-HIVE.

CARPENTER informs us that in every hive of bees the majority of individuals are neuters, which have the organs of the female sex undeveloped, and are incapable of reproduction, that function being restricted to the queen, who is the only perfect female in the community. If by any accident the queen is destroyed, or if she be purposely removed for the sake of experiment, the bees choose two or three from among the neuter eggs that have been deposited in their appropriate cells, which they have the power of converting into queens. The first operation is to change the cells in which they lie into royal cells which differ from the others in form, and are of much larger dimensions; and when the eggs are hatched, the maggot is supplied with food of a very different nature from the farina or bee bread which has been stored up for the nourishment of the workers, being of a jelly-like consistence and pungent stimulating character. After the usual transformation the grub becomes a perfect queen, differing from the neuter bee into which it would otherwise have changed, not only in the development of the reproductive system, but in the general form of the body, the proportionate length of wings, the shape of the tongue, jaw and sting, the absence of the hollow in the thighs where the pollen is carried, and the loss of power of secreting wax.

REMOVING HONEY FROM HIVES.

TWO years ago we tried the following experiment on a hive of bees, from which it was desired to take the honey. Having bored a few holes near the top of the hive, it was then inverted, and an empty box of the same size placed over it; both were then lifted into an empty tub, into which water was slowly poured, allowing time for the liquid to penetrate through the holes, but not too fast, in order to avoid drowning the bees. As the water rose among the combs, the bees found their way up into the empty box, which was then lifted off and pl ced on the beestand. The box, full of water and combs, was then lifted gradually out of the tub, the water escaping by the holes through which

it entered. The whole operation occupied but a few minutes, and scarcely any bees were lost. The short time necessarily prevented the honey from becoming dissolved, and, as the greater number of cells are sealed up, there is really little danger of such loss being sustained. After the water was drawn off it was found to be only slightly sweet; the combs soon became dry, and the honey was in no way injured—*California Farmer.*

COLORING CHEESE, Etc.

ONE of the means employed to give cheese a *rich cream color*, is to expose the curd before and after salting to the air, instead of hurrying it into the hoop or press, as is usual with the majority of dairymen. Every cheese-maker must have observed the fine golden color acquired by particles of curd that have accidentally remained out of the hoop and exposed during the day to the atmosphere. This is the precise color desired by the dealers, and in warm weather an exposure long enough for the desired color is practicable, and the appearance of the curd can be materially changed for the better, by letting it remain in the vat or tub until it has acquired the proper temperature for the press.

It is always preferable to cool curd in this way, instead of using water or cold whey on the curd, as is sometimes done for this purpose, as these last have a tendency to impoverish the cheese, by washing out a portion of its richness, besides injuring somewhat its flavor.

Fine flavor, quality, and the proper texture in cheese are important requisites to ready sales and good prices, but all these may be present, and yet the cheese sell low in market from its bad appearance. The *eye* must be suited as well as the *taste*, and it is difficult to make the consumer believe that pale, white cheese is as rich as that which has a fine cream color.

Again, many dairymen are troubled more or less in preserving a smooth, elastic rind; the rind checks, and deep cracks are found here and there in the cheese. This results often, and for the most part, from the air being allowed to blow on the young cheese. Cheese, when it comes from the press, and for several days after, or until the rind has a firm consistency, should be kept where the air may not blow directly upon it; and washing the cheese twice a week with hot sweet whey, will add much to its outward appearance. Annatto is in general use during spring and fall, for coloring milk for cheese making, but as much of it is adulterated with poisonous materials, its use should be avoided in summer, when the desired color to the cheese can be obtained as above described.—*Trans. N. Y. State Ag. Society.*

DAIRY PRODUCE AND MANAGEMENT.

AT a recent meeting of the Eye Farmer's Club, Mr. Horn read the following paper:—

It will be within our province this evening to review only those breeds most especially that belong to the class of dairy cows, which we may classify as follows—the Yorkshire, Ayrshire, Alderney, and Suffolk. The Yorshire being the largest and most numerous, we shall therefore take her first. The Yorkshire cow, as we term her, is descended from the Holderness crossed with the Durham bull, but a different animal to the Teeswater or high-bred Shorthorn. They are held in high estimation in and around London for the quantity of milk they yield, and if well kept, at the same time making flesh for the butcher. An average cow of this breed, for several months after calving yields 20 quarts a day; while some have been known to yield from 30 to 40 for months together. Some cows are supposed to yield from 4000 to 5000 during the year. It must be borne in mind that the food is of the most forcing description for the production of milk, without regard to quality —brewer's grains being a *sine qua non.* These cows form all the dairies of the Midland Counties; their milk is not rich in cream, yet on rich pastures or high feeding this is more than counterbalanced in quantity, and making beef at the same time, as we have the testimony of Mr. Horsfall, Barley Hall, Yorkshire, who so explicitly described his mode of management in his papers to the Royal Society's Journal—papers which I would strongly recommend every one interested in dairy management to peruse carefully. I must next advert to the Ayrshire: and I believe, taken as a breed, they are the most select as to milking properties. Ayrshire being a dairy county, the breed has been cultivated with the greatest care, and selected by distinguishing points known only to the initiated; and I hesitate not to state that we have no other class of cows, taken as a breed, that will produce the quantity of milk for food consumed. Hence the high estimation they are held in cheese-making districts. I

shall give you one illustration. We have one small cow in our dairy (of said breed) which is called Victoria, now well up in her teens for one season (pasture in the meadows only); for three months she averaged 26 quarts a day. We have records of much greater quantities than this, but she was a small cow, then only about 56 stone imperial live weight; so that every 27 or 28 days she produced her entire weight in milk; in short, she may be termed a milk giving machine. I now come to the Alderney or Channel Island cows, which in their own island are most valuable, both for the quantity and quality of butter they produce. They are not much in favour in the eastern counties, in consequence of the high prices which have to be paid for them when in profit, and their comparative small value to the butcher; and, moreover, our sharp east winds rather tell on their delicate constitution. When kept, it is mostly by private gentlemen for family use. They yield a fair quantity of milk, which is very rich in cream, and produces excellent butter. In their own island they are reported to yield from 10 to 12 lb. of butter a week during the summer; that result is very seldom obtained in this district unless under very favourable circumstances. In the West of England they are greater favourites than with us. However, W. Fisher Hobbs, Esq., of Boxted Lodge, has favoured me with the following account of two cows kept by him of the same breed. He writes as follows:—"At your request I send you a correct account of the produce of two cows (Alderneys) which I kept a my own residence, Boxted Lodge, in 1861. I had no other cows during that time. You will observe that the produce from these two cows was kept separate, from the period of their calving until the 12th of July. After that time the cream was mixed. The total produce of these cows in thirty-four weeks was 860 lbs., besides what cream was used in my house; this being an average of 25½ lbs. for the two cows during the thirty-four weeks. You will observe Mr. Hobbs states that the milk was kept separate from the period of calving until the 12th of July. For fourteen weeks previous to the date, one cow averaged 17½ lbs., and one week 20 lbs. 1 oz.—a quantity (for the length of time, be it remarked) I am not aware has ever been obtained from a cow of any other breed. So much for the Alderneys. We shall now briefly refer to the Suffolk. There are many gentlemen in this room who are better qualified to give an account of the Suffolk cow than I am, from the short period that I have been amongst them, and I shall be glad to hear them this evening. However, we have records of a polled breed of cattle in Suffolk for about 200 years, but of what shape or form we are left to surmise. In my opinion, at no distant period they have been crossed with the old Aberdeen, to which the best animals of the present day bear a striking resemblance. Blood red is now the favourite colour, with little or no white, unless the tips of the tails; but they have been so indiscriminately crossed latterly, with all sorts of brutes which could be called bulls, that in consequence we have nearly lost the original stock. In short, since the dispersion of the late Sir E. Kerrison's stock, it has been difficult in this district to find pure animals to breed from, and I wish to impress upon my dairying friends that it is just as essential, in order to obtain good milkers, that the male should be descended from as good milking stock as the female. Most people are careful as to the milking properties of the cow they breed from for the dairy, but the bull is seldom taken into consideration, and it somewhat surprises me, considering the hap-hazard manner in which they have been bred, how the Suffolk cows have still kept the milking properties for which they are justly celebrated. We have obtained 24 quarts a day from a Suffolk cow when in full profit, and I presume my dairying friends will not term them useful unless they yield from 18 to 20 quarts a day when in full profit. They are better adapted for the arid climate, rough and badly-farmed pastures of the eastern counties, than any other breed. They yield a good quantity of milk; and when properly fed, their milk is pretty rich in butter. Taken as a breed, their skins are coarser than either the Shorthorn or Ayrshire; in consequence, they are not so sensitive of flies; and, moreover, being without horns, they are more suitable when in yards. Likewise they are favorites with the Society for the Prevention of Cruelty to Animals, as they cannot inflict severe torture on each other; and when crossed with a proper Shorthorn bull, produce a good animal for fatting purposes. And, further, we have the testimony of Mrs. Rainer, of Thorpe, confirmed by other eye-witnesses, of her polled cow producing in one week 19 lbs. 15 oz. of butter, and for weeks in succession 18 lbs. 12

oz-, and for nine months 11 lbs. 4 oz. was the average. Mrs. Rainer had only this one cow; but, to use her own words, she "treated her like a child. Again, we have the late Mr. Lingwood's cow, at Brome, which produced 16 lbs. 4 oz. in one week, and for weeks averaged 15 lbs. She was also a single cow, kept by a private gentleman. The late Mr Pusey truly said, "Books will not teach farming, but if they describe the practices of the best farmers they will make man think, and show when to learn it." We must next proceed to analyze the systems of converting the produce into money. The most profitable is when the milk can be sold sweet from the cow, which in most localities will sell for about 8d per gallon; and if we take the general average of the Yorkshire cow, when well kept, as being about 800 gallons, then we find the produce will amount to something like £26 annually. In turning to our own country cows, they, on an average, may be supposed to yield 500 gallons, being about two gallons a day for nine months. Supposing these 500 gallons to be sold at 1½d per quart, we would then realize about £16 10s. with calf 10s. would make the result £17 per cow. When the milk cannot be sold, we must then convert the 500 gallons into cheese; then we should realize someting over 500 lbs. of cheese, which at 6 per lb. gives £12 10s calf and whey for pigs 30s, would make £14 per cow. By converting the cream into butter and the partly skimmed milk into cheese, we would then realize 160 lbs. of *good butter* at 1s. and 300 lbs. of *part* skim milk cheese at 4d per lb., which, with calf and whey at 30s, stands at £14 10, and, with proper management producing a good article, the price of produce may be raised, and these terms may be exceeded. We shall now find how this tallies with other districts. In Dorset and some parts of Somerset it is customary for dairymen to rent the cows from the farmer, the dairyman doing all labour, and the farmer providing cows and keep, for which the former pays for produce of cows £9 10s to £10 10. The produce is mostly converted into butter and skim-milk in Dorset; while in Somerset, some of the best Cheddar cheese is made now worth 9d per lb. A similar system prevails in the West of Scotland, but the produce is entirely converted into cheese, the cows are better kept, and the rents are higher, both to the farmer and dairyman. A late employer of mine rented a farm in the said district of 600 acres, his rent being £1200. He kept a dairy of 100 cows; and I have known his dairyman pay £12 for each cow, which covered the farmer's rent. The agreement was—the dairyman to do all labour attending the cows, unless some milking the farmer had to provide. Keep of cows was 1¾ acres for each cow, of good grass for summer; six tons of Swedes and two bushels of beanmeal for each cow, with straw *ad libitum*. The dairyman would realise about 4½ cwt. of cheese from each cow, and when properly manufactured would sell about 70s per cwt. The produce would run from 14 lbs. to 15 lbs. per cow I have thus, gentlemen, endeavoured to bring under your notice the different systems that are practised in other districts. I have stated results which have been and may be realized with proper management; and one naturally begins to wonder why Suffolk, once so prominent in dairy management, is now getting into the shade; the complaints are *loud* and *long* that no dairy maids are to be found. Again, some maids maintain that there are no places for them to learn, as no *one* will take the trouble to teach them. *But they are not easily taught who don't want to learn;* and as crinolines and feathered caps are more in unison with nursery-maids, table-maids, and house-maids, the washing, scrubbing, working, rosy cheeked dairy-maid of *old* is nowhere to be found; so if the dairy *is* left to the maid, the maid must have the boy to do it; and if left to the boy, to use a popular phrase, it soon must go to the dogs. We are told that cleanliness is next to godliness; and in no case is it more applicable than in dairy management. Morning and evening, Sunday and Saturday, twice-a-day the dairy must be attended to; *for, be it remembered*, it 'is only a first class article which commands attention in the market. We now come to the last branch of our subject, and one on which I doubt not all of you are familiar—converting the cream into butter; a very simple, but at certain seasons, with certain feeding, a very ticklish operation to make a first-rate article. As we make a middling article, I shall give you an outline of the system we pursue. During the winter our cows are fed on roots and chaff in conjunction; the first part of the season on Scotch yellow turnips or Swedes: after Christmas on mangolds. Those in full profit receive about 4 lbs. to 5 lbs. of cake or corn in addition. It is when fed on roots that the

care and experience of the dairy-maid are put to the test to produce a good article. Our dairy people maintain that if we send the milk into the dairy free from taint, they will produce butter agreeable to the palate; therefore, when the cows are on roots we invariably use a small quantity of saltpetre put into the milk *warm from the cow*, in order to dispel any effluvium the roots may produce. Care must be taken not to use too much; if so, the butter will taste rancid; say an ounce to every 30 gallons. We shall now go into the dairy, and, to use an Irishism, we don't allow the butter to spoil before it is made, that is, stale vessels taint the milk, or stale milk taints the cream, and tainted cream will not produce first-class butter; and as our object is quality before quantity, our customers being rather fastidious in taste, we must endeavour to produce a sweet article. The milk is first creamed at 24 hours, and again at 36; in so doing, both milk and cream keep sweeter than if only once creamed at 36. We churn thrice a-week. We use no artificial colouring. Our spare butter g[illegible] ..est-end Miss," at prices varying from 14d to 17d per lb. There are many *if's* and *and's* in order to make good butter where cows are fed on roots; but the dairymaid claims them as her knowledge of the art, and which would be tedious to describe. Gentlemen's dairies are in unison with "home farms." Neither are proverbial for large profits. However, while our injunctions are to produce a first-class article, we at the same time have an eye to profit. Our dairy of milk cows are 24, and they cost us for dairying and attendance 24s or 1s a-head per week; and on examining our dairy book for 1862, after deducting said labour, I find a credit of £10 standing for each cow. Be it remembered, we wean a calf for each cow in addition. In the foregoing observations I have endeavoured to bring under your notice the breeds of cows best adapted for dairy purposes; thus we find the Yorkshire the favourite, where pastures are rich and quantity required. And again, in the western part of our island, where cheese-making prevails we find the Ayrshire the universal favourite; and when only cream and butter are required, we find the Alderney in esteem. It is said Ireland for the Irish, and we must say, "the Suffolk cow for Suffolk;" for after a trial of all the breeds I have named, it is found by experiment in our establishment that they are the cows best adapted for the district. There is no doubt many of you have exceeded our small profits: but it may be equally true on some farms, for want of care and attention in the management of produce and stock, they have not been obtained. And now, in conclusion, I would advise my dairying friends to endeavour to improve our stock of Suffolk cows, and to be a little more careful in the choice and selection of bulls, endeavouring to obtain them from good milking stock. Even now they are, and with care and attention they might be made a very valuable animal for the district. I have generally treated the subject with reference to the soil and climate of this country. With more rain, less easterly winds, pastures naturally richer and better farmed, other breeds might be found better suited than the red Polls.

—There are certain fixed expenses on land, whether we grow a large crop or a poor one, rent, tithe, taxes, manual and horse labor, and seed, become a very heavy percentage of charge on a minimum crop, whilst on a maximum one the expenses are proportionately diminished.

ENGINEERING DEPARTMENT.

STEAM CULTIVATION.

THERE is no subject which has been more thoroughly discussed in British agricultural journals and at agricultural meetings in England, during the past year or two, than steam cultivation and the breadth of land under this method of culture is constantly increasing. The *Scottish Farmer* says:

The time has gone by when it was necessary to insist upon the advantages of tillage by steam. Every one who has seen the steam-plow at work is thoroughly convinced of its excellence—of its vast superiority over the horse-driven implement. Wherever it has been in operation its success is testified to by heavier crops, and fields freer of weeds than others adjoining, on similar soils, and subjected to the same treatment in all respects save in the employment of steam as a motive power in

stead of horse-flesh; and every one who has used the steam apparatus intelligently and skillfully, can report a saving in the mere cost of the tillage operations, as well as a profit resulting from the increased returns of cereals and roots which it insured. There are cases indeed where, through the cost of working, the great number of breakages, &c., and the little labor performed, the steam-plow would seem to be less profitable than horses, but such are merely exceptions; and so far as we have been able to examine them, they have all occurred in consequence of the steam apparatus being employed under adverse circumstances, under conditions so unfavorable that no sensible man would have thought of using it. To be perfectly successful, the steam plow must be employed in large fields free from stones, and it must be at the absolute disposal of the farmer—not in the hands of a company. To put it in into small fields filled with boulders, as has not unfrequently been done, is about as absurd as to try one of our first-class steamships in the water of Leith or a mountain burn. The steam-plow must have space; and it must be in the power of the agriculturist to make use of it any hour the weather and the other operations of the farm permit. Without such fredom of space and time it is impossible to make it pay—with that it cannot f il to be profitable.

All this, as we have already said, is now generally admited, and all that prevents the general, we might almost say the universal, adoption of steam as a tillage power wherever the land admits of its employment, is the expensiveness of the apparatus. At the present price it is impossible that small farmers whose lands are suitable can take advantage of it. The first outlay is so great that the saving it would effect would scarcely justify them in laying out the money, as the saving could hardly pay the percentage thereon, especially in cases where a portion of the lease has run. And in the great majority of cases, men cultivating middling-sized farms have not so much money to lay out upon one machine. The Company that has been formed in London proposes, indeed, to supply steam-cultivating tackle, taking payment therefor in instalments; but such a method of becoming possessor of a steam-plow can never be so satisfactory as paying for it right off, and having it direct from the maker instead of through what may be called middle-men. It is very desirable, therefore, that manufacturers should now devote their attention chiefly to the cheapening of steam-tillage implements. If something could be produced for £200 or £300 that would do its work effectively, we are assured it would well pay the makers. Certainly in this direction more than in search after novelties, should manufacturers apply their skill, energy, and capital. "Small pr ofits and quick re urns" have proved the surest garantees of success with all shopkeepers, and we are satisfied that the same principle would not fail in connection with the steam-plow.

How much the agricultural community are interested in the question of steam cultivation, may be judged of by the fact that there are no less than two articles on the subject in the last number of the *Journal of the Royal Agricultural Society of England*, besides the report of the judges at Worcester.

The country, in fact, is ripe for such a reduction as we have indicated in the original cost of steam apparatus for the field, and he who is first to make it will not have need to rue.

PUT UP THE FARMING TOOLS.

IT would seem that common prudence and economy should impel every person to a careful collection and housing of his implements, after the summer's work was over, but we have seen enough of the ways of many farmers—men who would be offended if called careless or slovenly—both of which they are—to know it is not a very random estimate when we say that the tooth of time eats up more farming implements during the season that they are out of use, than the tooth of service does while they are in use. Men will buy a mowing machine at a cost of over a hundred dollars, use it a few weeks, leave it in a fence corner until snow comes, and then perhaps put it in a crazy open shed where it is thoroughly wet every time there is a storm, during the rest of the year, before haying time comes again. Now, as between leaving the machine in the fence corner and putting it in such a place there is hardly any thing to choose except that if entirely exposed, where the sun could dry off the water between storms, the wood work will not decay so rapidly as it will where it is soaked and shaded from drying, and the iron will not rust so deeply.

But both of these practices are abominable, and here in the audience of all people who read these lines, we lift up our voice against them and cry out for reform. A machine which is subjected to wet, if made of wood, is swollen and shrunk in the joints, and when desired for use in the field, is loose and ricketty, and soon goes to pieces. We have seen a farm wagon so shrunken in the heat of summer, that the owner must needs run it into a mill pond or a creek to swell out the wood so as to fill the irons and make the vehicle road-worthy. There is a coarse joke among men when speaking of some withered and antiquated human, that such a one will have to be soaked before she can die; a better application of this rude jest could be made in regard to certain farm implements that must be soaked to make them live—and this because—like whiskey-soaked men—they have become so used to soaking that they are not fit for any thing while in any other condition, and hardly while in that.

How much more satisfactory is it—not to say economical—when you have an implement that is made of good timber, that you keep it in such condition as it deserves, and thus always have a first class tool to your hand. Even those implements which are made all of iron and steel, will just as well repay a careful attention. If the working parts become rusted, the friction soon creates too much play, and the whole concern is deranged, and goes on grating and jarring and working itself to pieces.

Labor is becoming an item of too much importance to be wasted. The man who follows a ringbone horse at the plough, sacrifices too much of his own time, to be hindered with such a team, for the saving of the difference in the price of that and one that will do twice as much work in the same time; so the man who commits his labor to a faulty machine is by just so much the loser, both in quality and quantity of his work; and the way to avoid this loss is to get a reliable implement at first, and then to take care of it.

All implements, whether of wood or iron, should be put up while they are perfectly dry so as not to be nursing a rot or a rust through the winter. A brush of coarse oil or grease, rubbed over the iron work will keep that from taking damage; and for that matter, a coat of oil or varnish or paint, upon the wood work, will accomplish the same end for that. With these precautions, put the harvesting implements, plows, harrows and all like field machinery, into a tool house or shed, where they will be protected from the wet, both that which comes in the shape of rain or snow, and that which comes of allowing the articles to rest upon the damp earth. Water is a mighty good thing in its place, but a very bad thing when it is allowed to make too free with the implements of the farm.

HORTICULTURAL DEPARTMENT.

PACKING VEGETABLES FOR WINTER.

THERE are two ways in which farmers usually deposit their vegetables in the cellar for winter; one of which, we are sorry to say, is too common, is to take them up without much care, and with what earth happens to be adhering to them, and to throw them into a pile in one corner or other part of the cellar, where they remain until wanted for family use. We here allude to such vegetables as beets, carrots, parsnips, turnips, &c. If the cellar happens to be damp, many of them decay or lose their flavour; if it chances to be a dry one, a portion of them become shrivelled and too dry for use. The heaps are overhauled repeatedly to find such as are good enough for the table, and these confused and scattered heaps present anything but a tidy appearance, while the decaying ones produce an unhealthy air.

We have adopted another way, which we like much better. A few bushels of fine clean moss is obtained from dense woods or from swamps. Clean barrels or smooth-planed boxes are taken to the garden, (a dry day being selected for the occasion,) and the vegetables being taken up, well cleaned topped, and trimmed, are placed in the barrels or boxes, with alternating layers of the soft damp moss. When filled, the hand-cart or wheelbarrow conveys them to the cellar. The moss keeps them clean and sufficiently moist, preventing the accumulation of water on the one hand, and the drying and shrivelling of the roots on the other. They are always fresh and ready for use,

and are taken out from under the moss without the least difficulty. As the barrel is successively emptied, a portion of the moss is taken off and placed in another one for future use.

There are very few places where good moss can be obtained from the woods, within a reasonable distance: but if beyond reach, clean, moist sand may be substituted for the purpose of retaining the moisture It is, however, heavier and more difficult to handle, and the vegetables do not come out from it so clean and fresh as from the moss.

CULTIVATION OF FRUIT TREES.

WE have already mentioned the Emperor's visit to M. Jacquesson's extensive grounds near Chalons, where a new system of arboriculture has been introduced, under the management of M. Daniel Hoolbrenck. The following description will give an idea of that horticulturist's method. In the case of vines, M. Hoolbrenck, at the end of winter, bends down one or two vine shoots of the preceding year upon each stock, so as to lie below the horizontal, at an angle of 112 deg., counted from the vertical. All the other shoots are pruned away. In consequence of this inclination, the sap lingers under the bark, and favours the development of a great number of buds, which in due time become branches laden with grapes. On the other hand the sap produces at the base of the inclined branch a vigorous shoot, which springs up vertically, and which, in the following year, will replace the fruit branch. When several buds appear on the stem which, in the preceding year, produced the shoot laden with grapes, the weaker ones are removed, and only that which appears most vigorous is preserved. By this means the exhaustion of the stock is prevented, and in the following autumn a long and vigorous shoot is obtained, which replaces the other. M. Hoolbrenck proposes to apply this method to all fruit trees. Nevertheless, as the pear, apple, and plum trees produce fruit on the old branches, those which bore fruit in the preceding year cannot be suppressed. The bending of fruit branches on the pear and apple tree have produced extraordinary results in M. Jacquesson's orchards. The Emperor examined some young pear trees in the nursery with great attention, and found their branches two years old, laden with abundance of very fine fruit. The bending down of the fruit branches is peculiarly well adapted to trees that are slow in producing fruit. It gives the shoots, which would only give wood time to be transformed into fruit, branches in the course of a year, and it favours the production of fruitful shoots even on the old branches and bark. The Emperor's attention was especially attracted by certain old lemon trees, the branches of which were inclined at 112 deg., and which now display young lemons directly implanted on old branches deprived of twigs and leaves. Experience can show whether the trees subjected to M. Hoolbrenck's mode of treatment will live long, and continue to yield the abundant crops they have been producing for these last two years. Certain it is that his system is also applicable to herbaceous plants, such as asparagus, for instance, the stems of which, being bent down, produce new alimentary shoots from the middle of August to the middle of September. But M. Hoolbrenck does more; it is well known that the white part of asparagus is bitter and hard, and therefore unfit to eat. M. Hoolbrenck takes a bottle with the bottom broken off, and gives it a strong coating of whiting. With this fragment of a bottle thus prepared he covers each shoot of asparagus as it makes its appearance, thus preventing the admission of air and light. By this means all that part of the asparagus so protected becomes as edible as the upper part. M. Hoolbrenck treats the alianthus, or Japan varnish tree, in the same way, in order to provide a larger quantity of food for the new species of silkworm that feeds upon it, and as this insect thrives in the open air, he protects it from birds by means of nets.

RULES FOR TREE PLANTERS.

THE following important rules to tree planters are given by John J. Thomas, and if heeded, would save thousands of trees from destruction, and make many people richer and happier:

1. If the roots of a tree are frozen out of the ground, and thawed again in contact with air, the tree is killed.

2. If the frozen roots are well buried, filling all cavities before thawing any at all, the tree is uninjured.

3. Manure should never be placed in contact with the roots of a tree, in setting it out, but old finely pulverized earthy compost answers well.

4. Trees should always be set about as deep as they stood before digging up.

5. A small or moderate sized tree at the time of transplanting will usually be a large bearing tree, sooner than a larger tree set out at the same time, and which is checked necessarily in growth by removal.

6. Constant, clean, and mellow cultivation is absolutely necessary at all times, for the successful growth of the peach tree, at any age; it is as necessary for a young plum tree, but not quite as much so for an an old one; it is nearly as essential for a young apple tree, but much less so for an old orchard; and still less necessary for a middle aged cherry tree.

7. To guard against mice in winter with perfect success, make a small, compact, smooth earth mound, nearly a foot high, around the stem of each young orchard tree.

8. Warm valleys with a rich soil, are more liable to cause destruction to trees or their crops by cold, than moderate hills of more exposure, and with less fertile soil—the cold air settling at the bottom of the valleys during the sharpest frosts, and the rich soil making the trees grow too late in autumn, without ripening and hardening their wood.

9. The roots of a tree extend nearly as far on each side as the height of the tree; and hence to dig it up by cutting a circle with a spade half a foot in diameter, cuts off more than nine-tenths of the roots; and to spade a little circle about a young tree not one quarter as far as the roots extend, and call it "cultivation," is like Falstaff's men claiming spurs and shirt collar for a complete suit.

10. Watering a tree in dry weather affords but temporary relief, and often does more harm than good, by crusting the surface. Keeping the surface constantly mellow is much more valuable and important—or if this cannot be done, mulch well. If watering is ever done from necessity, remove the top earth, pour in the water and then replace the earth—then mulch, or keep the surface very mellow.

11. Shrivelled trees may be made plump before planting, by covering tops and all with earth for several days.

12. Watering trees before they expand their leaves should not be done by pouring water at the roots, but by keeping the bark of the stem and branches frequently or constantly moist. Trees in leaf and in rapid growth, may be watered at the roots.

13. Young trees may be manured to great advantage by spreading manure over the roots as far as they extend, equal to the height of the trees, in autumn or early winter, and spreading this manure in, in spring.

14. Never set young trees in a grass field, or among wheat, or other sowed grain. Clover is still worse, as the roots go deep, and rob the tree roots. The whole surface should be clean and mellow: or if any crops are suffered, they should be potatoes, carrots, turnips, or other low, hoed crops.

CULTURE AND VARIETIES OF THE RASPBERRY.

RASPBERRIES can be more easily and cheaply grown than strawberries, and for that reason the fruit sells at a lower price. A plantation of raspberries will last many years, as they are, of course, renewed to a certain extent every year, by cutting out the old wood that dies after ripening the fruit. They should be cultivated in hills or stools, and should be set in rows three and a half to four feet apart— I should prefer the latter distance—and about three or three and a half feet apart in the row. All the suckers or new shoots outside of the stools, should be hoed up, unless they are wanted for new plantations.—They should be nicely tied up to a stake in the spring, soon after they are lifted. Most, if not all of the finer kinds of raspberries in cultivation, need to be laid down and covered in winter the better way is to cover with earth. The ground should be well manured either fall or spring. The demand for this fruit in market is not extensive, as compared with the demand for strawberries. The time is so short between that fruit and blueberries, and other berries which can be bought for a much less price, that sometimes raspberries will hardly pay for picking; still, every garden should have its plat of raspberries, that a succession of fruit may be secured for the table. The variety considered best, and grown most for market is the Franconia. It is not so large as some, but it is a firmer fruit, and bears handling and transportation better. Fair quality; color red; good bearer.

The Knevett's Giant is one of the best raspberries—perhaps the very best one—cultivated in this region. It is quite large, fine flavored, early, red, fruit tender, and for that reason not grown to any great extent for market.

The Fastolf is almost as good as the Knevett's Giant; red, large, and good flavor, but tender in fruit; not fit for market; fit for home use.

Brinckle's Orange is an excellent berry, and of fine quality. It is of a beautiful orange color when fully ripe; good size; great bearer; should be grown for home use only, as a yellow raspberry is not a popular fruit for market. This variety and Knevett's Giant, are good enough, and one need not look further for raspberries, according to my experience.

The Catawissa is more like the wild black raspberry, in size, color and flavor, though better.—It often produces a full crop of ripe fruit quite late in the season. I think it worthy of a further trial.

The Red Antwerp is mostly gone by in this region.

There are other varieties that might be spoken of, but I have given the best, and will not take time to refer to others.—*N. F. Farm.*

NEW METHOD OF MULCHING SMALL FRUITS.

SMALL fruits, such as raspberries, grapes, gooseberries, currants, blackberries, &c., are much benefited in garden culture, b. "mulching," or covering the spaces between the rows with coarse litter, straw, salt, hay, tan, &c. The mulching not only keeps the soil moist, but it prevents the growth of weeds; and, *shading the earth*, is in some mysterious way almost equivalent to manuring, as it creates certain chemical changes to take place in the soil, which cannot go on under the influence of light, in the absence of moisture.

Now in market gardens it becomes rather a formidable and expensive job to mulch small fruits by the acre every year or two, and few cultivators, we presume, attempt it, although all admit the importance, if not absolute necessity of it, especially in dry seasons. The raspberry can scarcely be raised in perfection without mulching; the gooseberry not at all. To mulch an acre of raspberry plants, will require at least twelve tons of litter, worth, six miles from Philadelphia, five dollars per ton,—sixty dollars.

I have for some time, been studying how to perform this very desirable process of mulching in a cheap and efficient manner, and I think I have accomplished it very satisfactorily, by *growing the mulching material on the ground required to be mulched.* The plant employed for the purpose is the Southern field pea, or cow pea, a very strong growing leguminous plant, which will succeed on almost any soil, without manure, and in sixty to ninety days will produce as much vegetable matter upon an acre, as can be found in a clover sod two years old. This is the plant now so much employed as a renovator of sand and barren soils in Virginia and other Southern states. A crop of cow pea vine turned under when green, is the best possible preparation on exhausted soils, for wheat and corn. This pea I saw in rows between grapes, raspberries and other small fruits, either broadest, or (a preferable mode,) in a wide drill, about as thick as you would for an ordinary crop of early peas. It starts in a few days, grows rapidly, keeps down the weeds, shades the ground perfectly while growing, and furnishes an ample mulching when cut down while in blossom; thus producing at a cost of three dollars for seed, and a little labor, a substitute for sixty dollars' worth of litter, which would be required to accomplish the same object by mulching in the ordinary way.

The pea, it is well known, obtains its chief supplies of nutriment from the atmosphere, and draws very lightly upon the ammonia in the soil; or rather, it will grow vigorously in a sandy, barren soil, almost destitute of carbon and ammonia, the two most valuable constituents of rich soil. The pea, however, demands lime or potash, which it no doubt finds in sand, but it is greatly improved (and so are all small fruits) by a supply of lime added to the soil.

By this method of mulching, I save buying or using of valuable litter. I shade the soil perfectly all summer, and extract from the atmosphere, by means of my peas, enough matter, (carbon,) ammonia (nitrogen,) and earthy salts, (potash, soda and lime) to furnish a large part of the foliage, wood and fruit of my next crop of fruit: thus making the peas perform the part, not only of a mulching substance, but a provider of food for my fruits.

If the reader will look at any analysis of the peavine, he will find it richer, in nitrogen or ammonia, than any other straw; and yet it is a well-known fact that the pea and especially the cow or field pea of the south, will grow in a poorer soil than any other plant, except weeds, moss, or something of that sort.

In this view of the pea, it becomes a

constant renovator of the fruit garden, as well as a mulching substance, and as such I invite the attention of gardeners and amateurs to its great and peculiar merits.

THE EASTERN APPLE CROP.

THE apple crop was probably never better in this and the adjoining counties than it is at the present time, says the Rochester (N. Y.) Democrat. The trees are literally bending with their weight of fruit. Much of the autumn fruit has already been picked and sent off to market, and it has brought highly remunerative prices.--Some varieties, such as the Fall Pippin and Detroit Reds, have sold even as high as $2.50 to $3 per barrel. This season of high prices, however, is past, and the market is again quiet. There is a large number of buyers in the field, although apples seem to be quite plenty in most sections of the State, and in some portions of New England. Those conversant with the supply and demand, inform us that the prices of winter fruit will probably range from $1.25 to 1.50 per barrel, exclusive of the latter. The range last year was from $1 to $1.25. Most of the fruit purchased in this vicinity finds a market in New York, Boston, and Providence. We learn that extensive purchases of apples are being made in Orleans county, for the Philadelphia and Baltimore markets.

DOMESTIC ECONOMY.

VALUE OF INDIAN CORN.

BY those who do not know, or are too scientific to profit by the experience of nations of men and herds of fat cattle, Indian corn, rice, buckwheat, etc., are only considered good fodder. Liebig states that if we were subject to the same degree of cold as the Samoiedes, we should be able to consume the half of a calf and a dozen candles at a single meal. During excessive fatigue in low temperature, wheat flour fails to sustain the system. This is owing to a deficiency in the elements necessary to supply animal heat, and the strong desire for oleaginous substances, has led to the belief that animal food is necessary to the human support. But late scientific experiments have led to better acquaintance with the habits of the North American Indians, and show that vegetable oil answers the same purpose as animal food; that one pound of parched Indian corn, or an equal quantity of corn meal, made into bread, is more than equivalent to two pounds of fat meat.

Meal from Indian corn contains more than four times as much oleaginous matter as wheat flour; more starch, and is consequently capable of producing more sugar, though less gluten; in other important compounds it contains nearly as much nitrogenous material. The combination of alimentary compounds in Indian corn renders it alone the mixed diet capable of sustaining man under the more extraordinary circumstances. In it there is a natural coalescence of elementary principles which constitute the basis of organic life, that exists in no other vegetable production. In ultimate composition, in nutritious properties, in digestibility, and in its adaptation to the various necessities of animal life in the different climates of the earth, corn meal is capable of supplying more of the absolute want of the adult human system, than any other single substance in nature. —*Mass. Ploughman.*

HYGIENIC PIES AND PIE CRUSTS.

PIES, as usually made, are among the greatest abominations of modern cookery. The idea of eating a piece of bread an inch in thickness, covered with from one-quarter to a half or whole inch of lard or butter, would by every sane person be considered preposterous. But people use these same proportions of flour and grease in their pastry, thinking it delicious. Consult any of the ordinary cook books, and you will find the recipes for pastry varying from half a pound to a pound of lard or butter to each pound of flour, and white flour at that. Can any thing be conceived much more indigestible?

But pastry without either butter or lard for "shortening," and a pie without spices or seasoning of any kind except sugar, must be a very insipid affair! most cooks would exclaim.

Very far from it, as the experience of thousands proves. Pies may be made far more delicious to the natural taste, without any of these ingredients, and at the same

time nearly as wholesome as plain bread and fruit.

We give below recipes for quite a large variety of pies, which any cook, with but little practice, ca succeed in making, provided she has a heart in the work, and desires to see hygienic cooking take the place which it deserves.

POTATO PIE CRUST.—Boil one quart dry, mealy potatoes. The moment they are done, mash them, and sift through a collander. Stir thoroughly together one cup of Graham flour and one cup of white flour, then add the potatoes, rubbing them evenly through the flour in the same manner as the shortening in common pie crust. Have ready one cup of corn meal; pour over it one and one-third cup of *boiling* water, stirring it till all the meal is wet, then add to it the potatoes and flour, mixing only till thoroughly incorporated together. No more flour should be added. The moulding board should be well covered with dry flour, however, as it is slightly difficult to roll out. It should be rolled very thin, and baked in a moderate oven, care being taken that it is not overdone, as a little too much baking is apt to render it tough.

NOTE. (It is very essential that the above conditions should all be complied with. Bear in mind that the potatoes must be hot, and mixed immediately with the flour; the water be poured while boiling upon the corn meal, and the whole mixed together very quickly, and baked immediately.

CREAM PIE CRUST.—Take equal quantities of Graham flour, white flour, and Indian meal; rub evenly together, and wet with very thin sweet cream. It should be rolled thin, and baked in an oven as hot as for common pie crust.

NOTE. (This makes an excellent pastry if properly baked. Many patients have said to us they did not see how they could ever again relish the pastry in common use, this is so much sweeter and more palatable, to say nothing of its wholesomeness. It is more generally relished than the potato crust, although not quite so hygienic—the cream being the only objectionable feature.)

PUMPKIN PIE.—Select a pumpkin which has a deep, rich color, and firm close texture. Stew and sift in the ordinary manner; add as much boiling milk as will make it about one-third thicker than the common pumpkin pie. Sweeten with equal quantities of molasses, and bake about one hour in a hot oven.

NOTE. (Those who will try this method will be surprised to find how delicious a pie can be without eggs, ginger, or spices of any kind. The milk being turned boiling hot upon the pumpkin, causes it to swell in baking, so that is as nice as though eggs had been used.)

SOUR APPLE PIE.—Take nice tart apples. Slice them; fill the under crust an inch thick; sprinkle sugar over them; add a spoonful or two of water; cover with a thin crust, and bake three-fourths of an hour in a moderate oven.—*Dr. Trall.*

POWDER OF MILK.

THE powder of milk, added to water, forms an agreeable drink, and an excellent substitute for milk:—Milk, two pints; carbonate of soda, half a drachm; water, one ounce; sugar, one pound. The soda is to be pulverized and dissolved in water, and this solution added to the milk; the mixture is then to be gently heated and constantly stirred. When it is three-fourths evaporated, the sugar is to be gradually added, and the whole briskly stirred. After it is perfectly incorporated, the mixture is to be removed from the fire, poured into plates, and dried in an oven. When perfectly dry, it is to be finely powdered and kept in well-stopped bottles. One or two teaspoonsful is sufficient for a cup of tea or coffee.

COMMERCIAL REVIEW.

THE CROPS OF THE YEAR.

THE first momentous question for a nation to consider is securing an abundance of food. Nations and tribes once numerous and powerful have perished from the face of the earth by famines. From the first appearance of the potato rot in Ireland, nearly twenty years ago, the population of that island has diminished from above eight to a little over five millions. Thousands perished from famine, because of the failure of a root which formed a chief portion of their food. This took place in our own day, and is a sequel to many cases of a similar nature which occurred to other por-

tions of the globe. All the arts connected with civilization are dependent, not only upon an abundant supply of food, but a surplus supply for those who pursue the art of husbandry. If every man was compelled to till the soil to obtain a scanty supply of food for himself and family, civilization, as we understand the subject, would be unknown. There would be no books, no institutions of learning, and none of the fine arts practiced, in fact, no cities and no community in the whole earth of a higher type than the Bedouins of the desert. The very rapid advancement in population, in wealth and power of the United States, has been due in a great measure to the fertility of the soil and the favorable nature of our climate. Since the great West was opened up to culture by an energetic people, the vast surplus crops of the soil have tended to multiply manufactures, and advance education and all the arts with a rapidity unparalleled in history. The nature and quantity of the crops raised annually should, therefore, form the most prominent consideration for the people. For several years these have been wonderfully abundant, and large surplus supplies have been furnished for the populations of Europe, especially those of Great Britain, when the crops there had in a great measure failed for about three years in succession. As these surplus supplies of food chiefly furnish the sinews of war, as well as the arts of peace, considerable anxiety was felt respecting their condition and quality the present year. The anxiety was experienced because a severe frost had visited extensive sections of Ohio, Michigan, Illinois, Indiana, and Wisconsin, during the month of September last, and it was reported that corn, potatoes. and buckwheat had suffered to an alarming extent. Statistics collected and furnished by the Agricultural Department at Washington afford information on this subject of an instructive and deeply interesting nature. The total wheat product of the loyal States for 1863 is estimated at 191,068,239 bushels; oats, 174,858,167; corn, 449,163,894; buckwheat, 17,193,238; potatoes, 97,870,035. In 1862, the product was as follows:—Wheat, 189,993,500 bushels; rye, 21,254; barley, 17,981,464; oats, 172,520,997; corn, 586,704,474; buckwheat, 18,722,995; potatoes, 113,533,118 bushels. There has, therefore, been an increase of the wheat crop amounting to 1,074,739 bushels; of oats, amounting to 2,327,170 bushels, but a very large decrease in all the other crops, especially corn and potatoes—in the former amounting to no less than 137,540,580 bushels. About 40,000,000 of wheat and 11,680,000 bushels of corn were exported of the crop of 1862; but the crops in Europe this year have been very abundant, and the foreign demand for our supplies will thereby be diminished in proportion. The domestic consumption of corn is set down at 575,024,132 bushels annually, and at this rate there will be a deficiency this year of 125,869,000 bushels, and the hay crop is deficient about 1,624,000 tuns. This quantity of corn allowed for home consumption is large and in a certain sense hypothetical. Many millions of bushels of the crop of 1862 are still in storehouses, and millions have been wasted annually in the fields. Economy, with r spect to corn or wheat is an obsolete word in the great West, as is well known to all who have visited there. The total supply of grain and potatoes this year, with all the deficiency, amounts nearly to a thousand millions of bushels, or about forty-five bushels to each person, and is sufficiently abundant for domestic consumption, with an overplus to supply a considerable foreign demand.

The London Agricultural Gazette contains a carefully prepared statement of the amount of food imported into Great Britain and Ireland, from which it appears that the total computed value of these articles imported into the United Kingdom in 1862 reached the enormous amount of $465,139,940 in gold—a sum equal to three-fourths of the value of the entire exports of British and Irish produce and manufactures. By far the largest item is for wheat and flour, the inports of which in 1862 were no less than $188,775,300.

MONTREAL MARKETS.

Potash, per cwt.,	$6.10 to 6.15
Pearlash, "	6.85 to 6 90
Flour, Fine, per 196 lbs.	4.00 to 4.10
No. 2 Superfine,	4.20 to 4.25
No. 1 "	4.30 to 4.40
Fancy "	4.50 to 4.70
Extra "	5.20 to 5.30
S. Extra Superfine	0.00 to 0.00
Wheat, U.C. White, per 60 lbs.,	$0.90 to 1.02
" U.C. Red, "	0.90 to 0.91
Peas, per 66 lbs.,	0.70 to 0.71
Indian Corn, per 56 lbs.,	0.55 to 0.56
Barley, per 50 lbs.,	0.80 to 0.85
Oats, per 40 lbs.,	0.47 to 0.50
Butter, per lb.,	0.15 to 0.16
Cheese, per lb.,	0.08 to 0.08½