VERMONT FARMER.

W H Matthews 1jan75

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Newspaper Decisions.

The Courts have decided that—

1. Any person who takes a paper regularly from the post-office, whether directed to his name or another name, or whether he has subscribed or not, is responsible for the pay.

2. If a person orders his paper discontinued he must pay all arrearages, or the publishers may continue to send it until payment is made, and collect the whole amount, whether it is taken from the office or not.

3. The courts have also decided that refusing to take newspapers and periodicals from the post-office, or removing from the place and leaving them uncalled for, is prima facie evidence of intentional fraud.

WHISTLE AND HOE.

There's a boy just over the garden fence,
Who is whistling all through the livelong day;
And his work is not just a mere pretense,
For you see the weeds he has cut away.

Whistle and hoe,
Sing as you go,
Shorten the row
By the songs you know.

Not a word of bemoaning his task I hear,
He has scarcely time for a growl, I know,
For his whistle sounds so merry and clear,
He must find some pleasure in every row.

Whistle and hoe,
Sing as you go,
Shorten the row
By the songs you know.

But then, while you whistle, be sure that you hoe,
For if you are idle the briars will spread;
And whistle alone to the end of the row,
May do for the weeds, but is bad for the bread.

Whistle and hoe,
Sing as you go,
Shorten the row
By the songs you know.

—Rural New Yorker.

CREEDS OF THE BELLS.

BY GEORGE W. BUNGAY.

How sweet the chime of sabbath bells;
Each its creed in music tells,
In tones that float upon the air,
As soft as song, as pure as prayer;
And I will put in simple rhyme,
The language of the golden chime.
My happy heart responsive swells,
Responsive to the bells—sweet bells.

"In deeds of love excel, excel,"
Chimed out from lofty towers a bell;
"This is the church not built on sands,
Emblem of one not built with hands,
Its forms and sacred rights revere—
Come worship here, come worship here;
In ritual and faith excel,"
Chimed out the Episcopalian bell.

"Ah, heed the ancient landmarks well!"
In solemn tones exclaimed a bell;
"No progress made by mortal man
Can change the just, eternal plan;
With God there can be nothing new—
Ignore the false, embrace the true,
While all is well, is well, is well,"
Pealed out the good old Dutch church bell.

"Ye purifying waters swell,"
In mellow tones rang out a bell,
"Though faith in Christ alone can save,
Man must be plunged beneath the wave,
To show the world unfaltering faith
In what the sacred Scripture saith.
O, swell ye rising waters, swell!"
Pealed out the clear-toned Baptist bell.

"Not faith alone, but works as well,
Must test the soul," said a soft bell;
"Come here and cast aside your load,
And work your way along the road,
With faith in God and faith in man,
And hope in Christ, where hope began;
Do well, do well, do well, do well!"
Pealed forth a Unitarian bell.

"Farewell, farewell, base world, farewell!"
In warning notes exclaimed a bell;
"Life is a boon to mortals given
To fit the soul for bliss in heaven.
Do not invoke the avenging rod—
Come here and learn the will of God;
Say to the world farewell, farewell,"
Pealed out the Presbyterian bell.

"In after life there is no hell!"
In raptures rang a cheerful bell.
"Look up to heaven this holy day,
Where angels wait to cheer the way.
There are no fires, no fiends to blight
The future life; be just and right.
No hell, no hell, no hell, no hell,"
Rang out the Universalist bell.

"The pilgrim fathers heeded well
My cheerful voice," pealed forth a bell;
"No fetters here to clog the soul;
No arbitrary creeds control
The free heart and progressive mind
That leave the dusty path behind.
Speed well, speed well, speed well, speed well,"
Pealed out the Independent bell.

"No Pope, no Pope to doom to hell
The Protestant," rang out a bell;
"Great Luther left his fiery zeal,
Within the hearts that truly feel
That loyalty to God will be
The fealty that makes men free.
No images where incense fell!"
Rang out old Martin Luther's bell.

"All hail, ye saints in heaven that dwell
Close by the cross!" exclaimed a bell;
"Lean o'er the battlements of bliss,
And deign to bless a world like this;
Let mortals kneel before this shrine—
Adore the water and the wine.
All hail, ye saints the chorus swell!"
Chimed in the Roman Catholic bell.

"To all the truth we tell, we tell,"
Shouted, in ecstacies, a bell;
"Come, ye weary wanderers, see,
Our Lord has made salvation free;
Repent, believe, have faith, and then
Be saved and praise the Lord, Amen.
Salvation's free, we tell, we tell,"
Shouted the Methodistic bell.

Pen-Spatters.

Now the green apple doubles the little boys into quarto form.

"I say, Mick, what sort of potatoes are those you are planting?" "Raw ones."

One half of the world don't know how the other half live—and it is none of their business.

Mr. Przybylowicz is the name of a hotel keeper in Leavenworth, Kansas. It requires two men and a boy to pronounce it.

Janesville has an educated pig called Ben Butler. There is a chance for a libel suit—on the part of the pig.

Here, now, a piece of lifeless clay,
Lies Isabella Young;
Who, on the twenty-fourth of May,
Began to hold her tongue."

Correspondence.

For the VERMONT FARMER.

DOES FARMING PAY?

This subject has been agitated by the FARMER for several weeks, and as I believe it one that should be discussed until some remedy can be found to eradicate the evil of "toil without recompense" that assuredly attends the efforts of the majority of hard-working farmers, I will say a few words upon the subject. In looking at this matter, I consider we must take, to do the matter justice, a more liberal view of the case than to take individual instances of prosperity in farming. We must look at and speak of them as a class. Because some man has taken a good farm, stock, and tools, from the hands of his ancestor, and is now able to say he owns it, we must not be narrow minded enough to overlook the ten, yes, twenty farmers who are laboring under a heavy mortgage, to liquidate which is almost as hopeless as to stay the flight of time.

Let any reader of the FARMER, upon the reading of this article, look over a list of his *farmer* friends with an eye to their financial condition, and he will be surprised to see how few of them are really sound to the core. Rottenness abounds among the farmers; still all the farmer raises that is really excellent goes to market, and the money is distributed among the creditors at the village, and if a little is left a spasmodic effort is made to pay up the arrearage of interest on the farm. The strong arguments against farming as a money-making pursuit are facts that will develop themselves when we examine the records of a town and see who holds these mortgages. Is it, generally speaking, farmers? Most emphatically *no!* We find nearly all held by congressmen, lawyers, doctors, manufacturers of all kinds, even down to the common day laboring mechanic who demands and receives of the farmer for 10 hours' labor three dollars per day. Last in honor, but not least in numbers comes the sleuth-hound of a speculator who handles the products of the farmer's hard summer's toil, securing to himself enough profit to enable him to advance the farmer a few hundred dollars at nine per cent. secured by mortgage, the result of which operation, nine times out of ten, will be as destructive to the farmer's family as the dram shop of olden times was to the family of the drunkard. While the farmer seeks another home with his disheartened wife and family of small children, when land is cheap and remote from civilization, the speculator repaints his buildings, repairs his grounds, comes out with a new style buggy, and his family visit the White Mountains, or watering places, to regain health or popularity; and the same will hold good relative to the families of any class except farmers. They and their families are obliged to toil early and late through life.

This is a matter that should be looked direct in the face. Farmers hold the reins, but drive when and where the occupants of cities and villages tell them to. Money is in thickly settled places, and to secure it nearly all young men of enterprise leave the farm and engage in business growing out of large places. Here, then, we see a serious drawback to advancement. Now farming is a good business if it could be brought to become a power, and I hope that through the influence of able men it may become so.

Every thinking farmer will see I have not made one erroneous statement, and the certain tendency of enterprising young men to go into business other than farming shows, more plainly than words can express, which way the wind blows.

As farming should take its proper place, and can only do so through the combined efforts of farmers, I hope we may all put forth our best efforts to secure the desired supremacy of power so much needed.

We have already a powerful aid through the influence of the grangers and the press, and when we can walk up to the ballot-box and cast our votes without fearing we may offend the plethoric speculator who holds the mortgage, or the village merchant who holds a claim for the last year's store bill, and elect an honest, sound-minded farmer to represent us in national and state assemblies, we may then know whose bread and butter we are eating, and stand up before the world men, as God intended we should be.

As a class we read too little, and work hard. We farm too much as father did, paying no heed to what men of science are willing to tell us. Have an agricultural paper in the house. Educate your boys to speak honorably of farming. To-day if a city or village swell asks a farmer's boy if he has "planted his hoop-poles," or got the hay-seed out of his hair, he will color like a school girl, and feel as though he had been engaged in some criminal act. Now farmers, think of this, and who says I am wrong?

P. E. R.

Glover, June 25.

For the VERMONT FARMER.

"IT DON'T PAY."

Such was the remark of a farmer to me when in conversation upon the dairying business I recommended feeding cows with shorts and meal. "You can't make it pay to feed meal as you do," he added. "I think I have made money by feeding grain to *all* my stock." "You have made money out of pocket," he replied. "It may be, but I thought it profitable and was intending to continue, and perhaps increase the amount." "Well, you may, but I know your cows don't half pay for their meal in increased amount of milk or quantity of butter."

He was so earnest it cast a shadow over my theories of profit already and to be derived from good feeding of stock, so I pondered and looked over my farm, stock, and financial record. I examined everything closely, and the result was quite cheering. I found my stock had increased in numbers and improved in quality. My sheep, with plenty of milk, raised their lambs, and they were fat early for the market, where they brought the highest price. The crop of wool was larger and better, and my cattle found a ready sale, while the farm showed improvements in all the crops, and my financial record showed a clear gain of over two hundred dollars per year since I had fed grain largely to all my stock.

I then looked at the man's stock and crops. His stock has fallen off largely the last five years, owing to the lessening of crops, and he says the land in Vermont is all run out. His cows are thin in flesh and their hair sticks up like the quills of a hedgehog, and as I looked at them I did not wonder he wanted to get rid of them.

Having thus examined the condition of things, I put the question, Shall I quit feeding meal? and the answer comes, decidedly, *Can't afford to.* F.

Dell Farm, Passumpsic.

The Dairy.

LONG TABLE TALK ON DAIRY MATTERS.

Flavor of Butter.

A large butter dealer remarked some time ago in answer to the question, "How much first-class butter do you receive?" "Five per cent." Five pounds only out of every hundred are prime; butter is selling from ten cents to one dollar a pound.

We want to make an article of fine flavor, good color and grain, free from buttermilk, solid and waxy; it is not enough to have butter free from bad odor or even well flavored; it must be high flavored.

There is so much inferior butter in the market, so much which has a bad odor, and brings such a small price compared to that of the sweet, first-class article, that it is well, before examining other features of the dairy business, to ascertain the causes of this large amount of poor butter, and see if we cannot avoid some and remove others.

The Cows.

Some cows will give plenty of milk, but the soft, white, frothy oleaginous substance obtained from their cream is not good butter. See that your cows are right to begin with.

The Milk.

Milk will sometimes stand too long before being skimmed; the best cream, composed of the largest globules, rises first, and some fancy butter makers will not wait for the cream to rise, holding the increase diminishes the quality of the butter: cheese factories that skim the night's milk before making cheese of it, make a fine article from this sweet cream; it is even claimed that the best butter must be made from milk twelve hours old, which will depend altogether on locality and treatment of the milk; if the cream stands too long before churning, too much of the milk sugar is converted into lactic acid, causing loss of flavor and quality also by transformation; churn when the cream is only slightly sour. Again, when the cream remains long on or off the milk, it forms a dry and leathery skin when exposed, which is composed largely of caseinous matter which does not get converted into butter, speedily causes decomposition in the butter, and it turns rancid early.

Vegetables.

Turnips, cabbages, garlic and other vegetables, inferior grass and weeds, will taint butter. Feed vegetables only after milking, and to remove animal odor and the scent of garlic, the heating of milk placed in a vessel of water to 140°, the boiling point, 212° is better, will drive away the essential oil of the vegetables—the origin of the scent—which becomes volatile by heat. A preventive—by feeding only good food—is better than this cure. Drive out garlic and golden rod, and queen of the meadow, and ox-eye daisy, and all of that class. Hard, but we are after "gilt edge" now.

Causes of Odor.

Improper substances in the vicinity of milk and butter will taint them. A piece of veal on the cellar floor; a pond of impure stagnant water; a kerosine lamp used in the milk room; a piece of soap left on a pan cover; coal oil in a country store; decaying vegetables; putrid animal matter in a cow pasture; cows drinking filthy water; partially decomposed milk, cream or cheese adhering to the dairy vessels, on the floor or shelving.

Oat Straw.

Oat straw will make white butter. Where there is much of this article to feed out and the object is good butter, it would be better to cut it up, moisten and put green food—bran mixed with corn and cob meal, rye, etc.—with it, for horses, for which it would make excellent food, than to give it to cows.

Hungarian Grass and Corn Fodder.

In search of some mysterious cause of bad flavor, we have heard Hungarian grass and green corn fodder complained of, but do not think the evidence sufficient to discard those eminently valuable forage plants from the list of soiling articles. Change your feed occasionally and watch results, and if they are injurious don't feed them.

Keeping Butter.

Great difficulty has often been experienced in keeping butter, and getting it to consumers after a fine article has been made. For short distances use the Philadelphia butter tub, or ordinary butter box, each of which has a central metallic—usually zinc—box for ice, around which on shelves is placed the butter. For long distances wrap the butter—pound or two pound packages—in thin muslin, put in the tub or barrel in layers, and filled with sweet pickle. Butter has come from California in this manner, and would ship and keep, if so prepared, to any part of the world. Before packing soak the vessel in strong brine for two or three days to saturate the staves.

Aeration of Milk.

This process is sometimes employed to remove the animal and other improper odors in milk; this may be done by a machine made for the purpose, a tin pump with a flaring top punctured with small holes and a rubber hose through which the milk is forced, falling from the pump in a spray, to the proper receptacle; or more simply by punching small holes in the bottom of a tin vessel and holding it some distance above the receptacle, pouring in the milk slowly and repeating the operation as often as may be desirable.

Milk in Room or Cellar.

Milk is sometimes, particularly in sections north of Maryland, kept in a room adjoining the sitting, dining or bed room, and is liable to be affected by floating impurities from victuals, stove or body, especially where insufficient attention is paid to ventilation; milk kept in a cellar with vegetables is liable also to be tainted.

Bear in mind, in all treatment and handling of milk, that sweet milk is an exceedingly ephemeral article, bearing within itself to a greater degree than any other article of ordinary commerce, the seeds of its own speedy and unavoidable dissolution, and this natural tendency to quick decay, inimical to the interests of the butter maker, must not be facilitated by permitting it to absorb still other agents to hasten the process, but where milk has become tainted from any cause, the process of aeration mentioned may be improved by putting a cloth over the perforated pail, and pouring the milk through that into it.—*Cor. Maryland Farmer.*

PATENT ARTIFICIAL CHEESE.

The Utica *Herald* remarks as follows upon the manufacture of a new kind of cheese, for which a patent was recently granted:

The insertion of the prepared solid fat of the body to take the place of the fat taken from the milk is not alone employed to make an imitation of butter. It is reported that, as fat and buttermilk are employed to make artificial butter, so fat and skim-milk are used to make artificial cheese. The aims involved are similar in either case, although the methods of manipulation are, of course, varied. It is reported that a factory is in operation in Brooklyn, where the olein and margarin expressed from the intestine fat of cattle is intimately mixed with skim-milk, and the rennet then poured in, producing a curd rich in oil, which can be cured, and sold for cheese. Here we have a process for putting back into skim-milk an animal oil in the place of the cream which has been removed. We have heard that something of this kind has been practiced nearer to Utica than Brooklyn. It is an ingenious device for adulteration, and nothing more nor less. No matter if the oil derived from the tallow be chemically pure, still the mingling of it with milk to take the place of cream is adulteration, and though it may not be a change of composition which produces an unhealthful material, it is a change which occasions a loss of value. Thus the schemes for artificial butter and cheese are fraudulent at the outset, even when we suppose that none but the purest oils and fats are used. If these compounds come into any wide consumption there will be materials used variously disguised which are wholly unfit for entrance into the system. Then will the evils of an enterprise which now seems only mildly objectionable be recognized and deprecated.

ONONDAGA DAIRY SALT.

This dairy salt is held in high estimation by butter and cheese makers. We have used it in our own dairy for three years, to our entire satisfaction. Analyses of this salt show it quite as pure as any of the foreign brands. We have kept butter eight months, perfectly, salted with it. We believe the American Dairy Salt Company who manufacture it, have perfected a system by which the greatest uniformity is attained.—*Colman's Rural World.*

The little anecdote of "How it saved a man's life" is a very funny story told about the Blanchard Churn. Send to any dealer in FIRST CLASS dairy implements for a circular containing it.

Stock Raising.

DANGEROUS STOCK FEEDING.

I wonder how many cattle and horses and sheep are destroyed annually by mistakes in feeding? I know of so many, even in this limited neighborhood, that the total must be alarming. Mr. So-and-So, wishing to get his horse "well up" for the show-yard, gives him wheat meal, so one morning he is found dead. Another Mr. —— loses half a score of valuable fat bullocks and some horses from nearly the same cause. The food is too nitrogenous and glutinous. The same remark applies in a degree to bean-meal. Horses getting at a heap of dressed wheat are almost sure to die. If beans and wheat were given in the same condition in which they grew—I mean with the same proportion of straw, pod and chaff—there would be no danger; for who ever saw a horse injured at harvest time by helping himself to wheat with its straw and chaff? Animals will seldom go wrong if they have plenty of chaff, pollard, &c., with their rich diet. Why are oats so safe for feeding compared with beans? Because they have a thick, chaffy jacket, not like the rich bean or dressed wheat. An old farmer, with a long or clear head, mixed his bean-meal with linseed oil made into balls. No fear of wind or blowing in such a case. Whenever I am short of green food in July and August, when the beans are full podded, I pass them, stems and all, through a chaff-cutter, and they make the best of food for all farm animals. In winter, the bean stalks, as hard as sticks, are passed through the chaff-cutter, afterwards moistened with hot water, and thus become soft and most acceptable food. No bean straw should ever go under foot. See its analysis, second only to hay. Italian rye grass, forced to rapid growth by guano, with its excess of ammonia, would kill our lambs, and even some of the older sheep; not so when manured abundantly with animal excrement. The same remark applies in a degree to ammonia-forced roots. Depend upon it, a mixture of straw chaff with very rich food is a profitable safeguard. So many cattle are lost by flatulence (distention or blowing), that my stockman and I often talk over the matter, especially as we never lose one from that cause; and he is of opinion with myself that our freedom from these losses arises from a pulping of the roots and their admixture with dry and fine cut hay and straw chaff, and with bean meal, bran, malt combs (culms), and cake. The food thus lies compactly in the stomach, but yet is free to receive the permeation of the gastric juices. It is easy to imagine that a mass of pulpy, adhesive, glutinous wheat or bean meal is by no means readily permeable. We know, by the old-fashioned use of the choke-rope, that some animals are apt to bolt their food in masses. I am a firm believer that the mechanical or physical condition of fine-cut straw in the stomach has much to do with digestion and health, as well as by its chemical composition. After 30 years of close observation and practice, both I and my men have come to a decided conviction that the turning out and roaming at large is a dangerous and unprofitable practice, and that it pays better to bring the food to the cattle than the cattle to the food; and that in the case of the sheep close folding and a removal of the fold (iron hurdles on wheels), every 12 hours is the truest and most profitable practice. The waste of food and loss of stock by the roaming at large plan is something fearful; besides the animals do not progress so well.—*J. J. Mechi, in Canada Farmer.*

WORKING PIGS.

We frequently hear about working horses and working oxen, but I write to inquire about working swine. It is my intent to purchase fifty to seventy-five hogs as early in the spring as they can be set to work composting meadow mud, soda, leaves and gleanings from the road side and all refuse from the barn and barnyard; in other words I want them solely to work! now as I shall start in the spring and have no last fall crops, such as potatoes and corn crib, roots, etc., to feed them upon, is there no way of soiling them, to keep them in good working order, as we do our cows in the dry time of summer. It is an old saying "Live like pigs in the clover;" now I suppose there might have been something in the maxim, or it would not have stood the test of time so well, and this will surely direct to my query, viz. can pigs be carried on through summer on green stuff, like clover, lucerne, fodder corn, etc., after they get advanced enough to cut, or is there something or *anything* better in the soiling line than the above? and as it will be May or June before these will be ready to cut to any amount, what can I feed upon during the early spring to keep my flock in good *rooting* condition?

C. C. PARKER.

Winchendon, May 9, 1874.

We once heard a close calculating, practical farmer say that he did not believe it paid to work swine, and we know that old Col. Jacques of Ten Hills farm in Somerville, a genius in his way, always maintained that it was the best economy to "put pigs on to their belly" at nine months old, that is to fat and kill them young. We incline to think he was right. Nevertheless there can be no doubt that manure under the barn is greatly improved by the mixing and working which a few swine will effect. This can be done to some extent, as an incident, but to keep swine for this special purpose is another matter. We should want to count the cost of it carefully before we undertook it.

Pigs can be summered at pasture very well and cheaply. We have known instances of this where they have lived almost wholly on clover and the roots of other plants which infest old pastures. There is nothing more healthful, but you could hardly expect to get a very rapid growth on them without some extra feed. Kept at pasture till October, and then put up to fat, they ought to gain rapidly.

Pigs ought to have access to plenty of water. To promote a disposition to root extensively, probably corn in the kernel and scattered about promiscuously, is as good as anything. Potatoes and raw roots are always useful, especially beets.—*Massachusetts Ploughman.*

I have a few breeding sows and a boar, that I fed on corn meal, shorts and pork scraps, until the first part of February; getting out of scraps, I commenced steeping hay in a common farmer's boiler, and feeding it to my hogs with less meal and shorts. My hogs ate it well, and do well on it. I cut about a bushel of hay, when cut put it in my boiler, fill with water, let it stand till morning, when I build up a little fire and warm it suitable for feeding, and feed three times a day. I usually salt my swill as I feed it. I think we as a general thing do not salt our food for hogs enough. The above amount I feed to six hogs a day.—*Cor. Massachusetts Ploughman.*

Poultry.

FATTENING CHICKENS BY MACHINERY.

It seems to be generally admitted by gourmands that no chickens not of mechanical fattening have such exquisite flavor as those submitted to the process. In the gardens of acclimation at Paris this is very scientifically practiced under the direction of M. Odile Martin. "Its advantages," say the authorities, "do not consist in the rapidity of the process alone, but above all in the special quality of the meat thus produced. It is solid, very tender, exceedingly fine grained, not over fat (which would not be an advantage), very white in color, and of a flavor quite exceptionably excellent." If this is so, of course there is no help for the chickens. They must perforce enter their epinettes, and be mathematically crammed. Behold here the ingenious contrivance of the gardens of acclimation for manufacturing this exceptionally excellent flavor.

It is a huge cylinder with fourteen faces, each in five stories of three compartments each. It holds, therefore 210 fowls. The cylinder is hollow and empty, except for the axis on which it turns. This hollow construction renders it easily ventilated and kept clean. Before it is a box for the operator. This box or carriage moves up and down by pulleys. The gaveur—that sounds less offensive than crammer—operates thus: Commencing at the bottom of one of these fourteen faces, he seizes with the left hand the neck of one of the chickens, and pressing on each side of the beak, the bird is forced to open its mouth, as any lady knows who has doctored a sick chicken or canary. The gaveur then introduces the metallic end of the rubber tube into the throat of the chicken, and by a pressure of the foot on a pedal the food rises, and at the same time the amount passing through the tube is indicated on a dial in front of the operator. It is, therefore, a skillful operation, for the gaveur, whatever other motions are necessary, must pay strict attention to the needle on the dial, or he will give his chicken too much or too little. The three chickens duly fed he turns the cylinder on its axis a little, and the next face of it is before him. When he has completed the round he turns the crank and the carriage rises to the next story; and so he goes on to the top. Having completed the upper circuit, every chicken in that epinette is duly fed. Then he turns the crank in the other direction, and the carriage descends to the floor, where it rests on a railroad. It is then moved along before the next epinette, and the whole operation on 210 more chickens is repeated. A skillful operator will gave, or cram, 400 chickens in an hour. That is less than nine seconds to each one; for the time to move the cylinder, to move the carriage up and down, and to the next epinette must be counted out. Under this epinette regime it requires an average of fifteen days to fatten a duck, eighteen for a chicken, twenty for a goose, and twenty-five for a turkey. The food used for chickens is barley and corn meal, mixed with milk into a dough so thin that no other liquid is required. The ordinary quantity given is from ten to twenty centiliters, or from seven-tenths to one and four-tenths of a gill each time; but this quantity is reached gradually. When the maximum that any chicken can assimilate is found, the number indicating this quantity is placed before its compartment, and the gaveur must measure it exactly on the dial.

Truly, this is an age of wonders. What a labor-saving invention this epinette must be to the chickens! Maybe it is not wise to give these details. What if some enterprising American should be thereby tempted to invest his whole fortune in a grand improved automaton steam power epinette, warranted to feed ten thousand chickens a minute.—*Harper's Magazine.*

No power can prevent wealth from accumulating at the great centers. Those who handle thousands of dollars daily must be expected to make money faster than the average farmer. The offset is that they can lose it faster also, and that the sure though slow gains of the farmer, and his life of independence and comfort for himself and his children are of unpurchasable value.—*Boston Journal.*

General Agriculture.

CHARCOAL AS AN AMENDMENT.

I want some treatise on the virtue, chemical properties, and proper application of charcoal as applied to land. My soil is light, sandy loam, and I can procure 100 loads of charcoal dust at little or no expense except drawing 1½ miles.—[Thos. Rodgers, Lewis Co., N. H.

We find the foregoing inquiry in the *New York Tribune*, together with the following reply by Prof. S. W. Johnson, of New Haven:

The "treatise" may appropriately begin with a collection of testimony on the observed effects of charcoal, according to the experience of farmers. In my lectures on Fertilizers, I have been in the habit of stating at the outset that practical experience asserts of every manure that it is good, that it is bad, and that it is indifferent. I have also said that simple practice can never get beyond this point, but must always go on contradicting itself—must maintain an endless controversy as to the facts of the action of fertilizers, and that science only can reconcile the contradictions of experience by searching out the reasons why charcoal, for example, here or now works beneficially, and there or then manifests no effect, or even operates detrimentally. After presenting some statements from those who have used charcoal as an application to land, I will attempt such explanations as the studies of scientific men enable me to offer.

Testimony.—In *The Albany Cultivator* for 1844, pages 46 and 183, Mr. R. L. Pell stated that he had used charcoal and nothing else as a dressing for land, at the rate of 52 bushels per acre, and had thereby obtained wheat at the rate of 78¾ bushels per acre. The value of this experiment is much diminished by the fact, detailed on page 146 of *The Cultivator* for 1847, that the plot of ground measured but two rods, and the wheat harvested amounted to only 31¼ quarts. In the same volume, page 74, it is stated, editorially, that "We have often seen used the dust from 'beds' where charcoal has been made. This dust consists of fine bits of wood covered with the earth, with which the wood is mixed in the process of charring. It is frequently used for corn, putting some, say two or three quarts, in each hill at the time of planting. It is also sometimes spread on grass land, and we have generally noticed that its effects were very favorable. Crops are generally better, except, perhaps, for the first year or two, on the beds where coal pits have been for several years." Again, page 234, a correspondent says: "My farm was, in the earliest settlement of the country, owned by a man who burned charcoal, and I find on those old beds always large wheat and bright straw, even if the rest of the field is poor, rusted and shrunk; and, in fact, all kinds of grain on these coal beds are good."

In the same journal for 1845, page 195, mention is made of an increase of the grass crop "of nearly one half," during a period of thirteen years, "where dry dust and fine coal" from a charcoal bed had been strewn over a meadow.

In *The Cultivator* for 1847, page 290, is the statement of L. Dille, of Ohio, that "he had sown wheat on a piece of ground three times, in each case with failure. Charcoal dust (quantity not stated) was applied in manure, and the succeeding crop was 25 bushels per acre of very fine and plump wheat."

In the same journal for 1849, John W. Bailey, of Plattsburgh, gives details of experiments on potatoes, which were all treated with a moderate quantity of well-rotted manure, and a portion of them with charcoal dust from the coal house of an iron works. From a row without charcoal he obtained 30 bbls., and from three rows dressed with charcoal he got 34, 35, and 35½ bbls. of potatoes, respectively.

In Watson's Survey of Essex County, published in The Transactions of the New York Agricultural Society for 1852 and 1867, we read, "In the midst of the disastrous drouth of the last summer, while crossing a field in Moriah, occupied by Mr. Richmond, I observed a lot thickly strewn with pulverized charcoal, which presented a rich verdure strongly contrasting with the blighted aspect of the adjacent field. The land is loamy. The refuse charcoal from an iron furnace was applied in September and October, 1850, at the rate of 1000 bushels per acre, to five acres, at a cost of $40. The effect was immediate. The grass freshened, and continued green and luxuriant after the surrounding fields were blackened by the early frosts. Although the past season has been so unfavorable, Mr. Richmond realized one-third more than the ordinary yield of hay, and sufficient to repay the whole outlay."

In succeeding paragraphs it is stated that the Hon. J. S. Whallon used charcoal dust to the extent of 250 loads annually for several years on light, loamy, and clay soils for hay, oats, wheat, and potatoes, with results "most favorable." Wheat was increased five bushel per acre on strong clay. Potatoes escaped the rot, and hay was more than an average crop, and always of the finest quality. Again, Mr. Ralph asserts that "as a top-dressing for meadows, charcoal dust, together with burnt soil and ashes left on old charcoal pit bottoms, has added at least one-third to the hay crop."

Another correspondent of *The Cultivator* for 1853, page 374, confirms the good effects of charcoal in preventing detriment from drouth. In Scotland and England record has been published of similar good results from the use of charcoal dust.

On the other hand Mr. Solon Ramsdell, of Elmira, N. Y., states (*Cultivator*, 1847, page 147,) that he "prepared a piece of eight acres of turf ground by summer fallowing, and about the 1st September had 600 bushels of charcoal ground, intending to cover the whole; it was, however, put on about three-fourths of the lot. He found, also, 30 bushels of charcoal dust in a tinner's shanty which (saturated with urine) was added, making 105 bushels per acre. It had no effect as manure. The following year the ground was planted with corn; no perceptible effect whatever. The soil is clay loam."

From this testimony it appears that charcoal has an excellent effect on light land deficient in attractiveness for moisture, especially in dry seasons. This is due to its great porosity and absorbent power for vapor of water. As is well known, charcoal takes up a large amount of water when kept in a cool, damp cellar—becomes, in fact, so wet that it is difficult to set it on fire. On a soil already hygroscopic from presence of clay or humus, or in wet seasons, it has, of course, no good effect from this quality. On a heavy clay, which is unfavorable to vegetation because of its compactness and slow penetrability by water, charcoal powder, like any non-adhesive dust, separates the clay particles, prevents their cohesion where it intervenes, and thus tends to make the soil more open, more friable and more early, promotes drainage, and sets in train a long series of changes for the better.

Charcoal strewn on the surface of light-colored soil, so as to blacken it, enables the soil to become warmed under the sun's rays more rapidly and more highly than would be the case otherwise. This fact would partly account for the good effects reported of it in cold climates.

Charcoal has been reputed to act as a fertilizer because of its absorbent power for ammonia. It does, in fact, condense in its pores 50 to 100 times its bulk of ammonia gas, when its pores are perfectly free from air moisture and all other gases, and when the ammonia gas is also unmixed with other gases. But these conditions never exist in nature, and the fact is that charcoal exposed to the air never contains or absorbs any important amount of ammonia, and does not fertilize by acting as a means of collecting and storing this gas.

Charcoal is a powerful oxidizing agent, and this quality may not unlikely come into play usefully when it is mixed with the soil. Dr. Stenhouse was the first to show that the offensive gases which escape from putrefying animal matters are deodorized and destroyed when made to pass a layer of charcoal dust, and that the result is brought about by the oxygen gas condensed in the pores of the charcoal. A dead rat nicely buried in a cigar box so as to be surrounded at all points by an inch of charcoal powder, decays to bone and fur without manifesting any odor of putrefaction, so that it might stand on a parlor table and not reveal its contents to the most sensitive nostrils. The gaseous products of decay under such conditions are carbonic acid, ammonia, and water, or the same that would result were the ordinary effluvium of putrefying flesh burned in a furnace. The soil often, if not always, contains nitrogen in combination with some form of humus, which is inert, or at least not immediately available as food to crops. Charcoal, we should anticipate, would hasten or set up oxidation of these matters, and might liberate a portion of this inactive nitrogen in the form of ammonia or of nitrates, and thus enhance the fertility of the soil. This is, however, but a speculation, a bit of theory, and while probable enough to warrant investigation, must not be accepted as a fact until it has been proved to be such.

As a direct fertilizer, *i. e.*, by virtue of anything it can yield of its own substance to crops, charcoal cannot be regarded as of much value. It contains of course, if it has not been washed by water, the ash elements of the wood from which it has been made, and when applied in large quantity, the potash, lime, &c., which it carries upon the land may easily produce a striking effect upon poor soil. This kind of effect cannot last more than a single season, and on a soil in fairly good condition would commonly make no show.

SAWDUST AS A FEEDING MATERIAL.

A number of carefully conducted experiments on the digestibility of woody fiber have led to the conclusion that the latter is assimilated by the animal organism in proportionately speaking larger quantities, to the extent even of 70 per cent., instead of 34 per cent., under a poor than under a liberal system of feeding (as regards quality of the diet).

According to the well known journal edited by Stockhardt, *Der Chemische Ackersmann*, several lots of five to six year old wether sheep had shown, on a trial being made, that they were capable of digesting as much as 80 per cent. of the woody fiber of paper pulp, 50 per cent. of that of poplar, and 37 per cent. of that of pine wood.

Notwithstanding, however, the nutritive qualities possessed by so cheap and universally abundant a material, no practical application resulted from the experience thus gained until dearth of provender and the high price of straw at length induced Mr. Lehmann, of the Tharander Agronomie Institution, to take up the subject afresh. Mr. L. commencing his trial of woody fiber in the form of sawdust, with ten cows and one in-calf heifer, endeavored to obtain reliable information on the following points:

1. Will cattle, without being driven to it by excessive hunger, eat sawdust when the latter is mixed with their other food?

2. Can sawdust be advantageously employed as a substitute for straw in feeding horned stock?

3. Have resin and the essential oils contained in pine wood sawdust any effect, favorable or the reverse, on the composition of the milk and butter?

4. What effect has long continued feeding with sawdust (mixed, of course, with other materials) on the health and condition of cattle?

The total live weight of the animals was 10,800 pounds, and they had been receiving daily, per 1000 pounds live weight, the following mixture:

31.7 lbs. sliced turnips, 2.2 lbs. oat shells, 3.5 lbs. chopped oat straw, 5.3 lbs. grains,	Mixed and then moistened with lukewarm water.
0.5 lbs. bran, 3.3 lbs. rape cake,	These (after the bran had been boiled in water) were added to the above.
8.9 lbs. long oat straw.	

The only difference made at first was to add for two consecutive days, for every 1000 pounds of live weight, 1.1 pounds of sawdust, obtained from a neighboring saw-mill and passed through a wide-meshed riddle. All the cows partook of the new article of diet, and no portion of their ration remained unconsumed. The like was the case during the next eight days, when the quantity of sawdust had been increased, and that of the long straw diminished, by 4.6 pounds. In all, this mixture, which appeared to completely satisfy the animals' hunger, was continued for fourteen days, and throughout that time no change in their health or general appearance could be perceived. On the other hand their milk, though the same in quantity as before, grew richer in quality, and the butter improved in flavor and composition.

Owing to the exhaustion of the stock of sawdust, it unfortunately became necessary to interrupt the experiment for the space of ten days, and to substitute for the new food 8.9 pounds—the amount originally given—of long oat straw. The other items of diet remained unaltered, and at the expiration of the ten days the experiment was renewed for five weeks without a break. The last change of regimen made was to replace the grains by turnip leaves (become slightly acid), to increase the allowance of sawdust from 1.9 pounds to 7 pounds, and to diminish in a corresponding degree, *i. e.*, from 8.9 pounds to 4.7 pounds, the amount of long straw. The mixture then consisted of—

34.7 lbs. sliced turnips, 18 lbs. turnip leaves grown acid, 2.2 lbs. oat shells