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THE ILLUSTRATED JOURNAL OF AGRICULTURE

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ENGRAVINGS.

Narrow gauge railways, (5 engrav.) p. 18, 19, 20. Jersey Belle of Seituat, p. 24. Jersey cow Eurotas, p. 25. Mechanical butter-worker, p. 25. Duchess grape, p. 23.

To Agricultural Societies.—At the request of several agricultural societies, we shall wait until the first of July next before striking out the names of such members as have not paid their subscription for the current year.

Another year, however, it is to be hoped the subscriptions may be collected before the 1st of May, as ordered by the Council of Agriculture's regulations.

Colonisation Railroad.

The great want of this country, up to the present time, has been Colonisation Railroads. Without these great arteries, it is impossible to win the wealth of our superb forests, the wood of which is often of more value, standing, than the cleared land.

In fact, it is not seldom that woodlands are to be met with, the timber of which would sell for several hundred dollars, if means could be found to convey it to market. Unfortunately, with our present system, the colonist finds himself obliged to cut

down and burn without mercy these rich productions of nature, at the risk of destroying the humus which

covers the soil, to the great detriment of his future crops.

Ten years ago, we saw, in our travels through Wales, a narrow gauge line, with a breadth of only 23½ inches between the rails. We travelled by it across that mountainous country at the rate of 30 or 32 miles an hour. Cheaply built, as it is, this line carries as much merchandise per mile, as the Grand-Trunk itself.

At the time we speak of, engineers were still in doubt as to the advantages offered by this railroad. It is no longer so. The Festiniog line has found imitators all over the world, and those who visited the last International Exposition, at Paris, had an opportunity of judging, by ocular demonstration, of the value of narrow gauge lines. M. Decauville, of Petit-Bourg, France, a manufacturer on a large scale of all the necessary complements of these railroads, laid out a line to the Bois de Boulogne, only 20 inches between the rails, and, on certain afternoons during the Exhibition, more than 3000 persons made the journey by it. The annexed cut shows the same road as it is to-day in operation at Petit-Bourg, worked by an engine weighing 5000 lbs., and travelling at the rate of 15 to 18 miles an hour.

The Festiniog line, is wider, measuring, as we said, 23½ inches between the rails. This width is sufficient, as we shall see, for the transportation of a heavy traffic, at a great

pace. We read as follows in a recent publication:

“Amongst the Welsh narrow-gauge lines, the most celebrated is the “Festiniog Railway.”

It owes its reputation not only to its being the oldest, but to the peculiar ingenuity with which it has been built.

For several years it has been quoted as an example, and its pecuniary returns have rendered it worthy of all



Decauville Railway,—20 inch wide.

praise. In spite of its narrowness, it has given some years \$9,600 a mile of gross receipts, and the net product has

amounted to nearly \$4,500 a mile: results which have assuredly not been arrived at by all the lines of 4½ ft. gauge.

The first thing to be examined at Festiniog is the rails. So important has been the proper working of this line, that of late years locomotives have been used weighing 20 tons, ensuring a speed between the stations of 31 miles an hour; to attain this result rails of 16 lbs. to the foot have been employed.

The whole of the Festiniog line may be said to lie in a series of curves, 14 miles long; and this is necessarily the case, for otherwise, the gradients would be too great. The least radius of the curves is 35 mètres, in lengths of 25 to 50 mètres, and others of 45, 50, and 60 mètres. The mètrè equals 3'39" English feet.

Hardly any straight road occurs to separate the curves which have a contrary direction, and, at certain times when the slates are very much in demand, trains are run of 300 mètres long, which are thus sometimes engaged with three different curves at once.

Travellers are often greatly surprised that they hardly know, by the motion, that they are passing over curved lines, especially in fast trains. This result has been arrived by tracing the curves parabolically, which makes them stiffer, (raides) at the summit, but easier at the entrance, the extremities gliding, so to speak, into the alignment of the curves of an opposite direction.

All the Engineers who have visited Festiniog have been much struck by this system of

treating the curves on a narrow gauge line; and the following article, taken from "Engineering," of December 25th, 1871, will be read with interest.

"The entrance of the train into a curve, or its passage from one curve to another is not felt. Some of our readers will accuse us of exaggeration, but none of those who have visited Festiniog will contradict us. We must confess, however, that before travelling on this line, we had read with considerable incredulity the accounts of the extraordinary ease and security with which the curves on the Festiniog Railway were traversed: but as we have really experienced this ease and security, it is only right that we should make up for our previous want of faith, by the addition of our testimony to that of others.

The trains coming from the quarries descend alone, and the locomotive that accompanies the train is to act as a check. For the ascent, each locomotive draws 130 to 150 tons of gross weight, full and empty wagons, and the trains are often 300 mètres long.

Some engineers say that this result, on a line 23½ inches wide, is a trick, or clever arrangement; but if it were intended from the first to build a line to carry such heavy freights, so narrow a gauge ought certainly not to be adopted.

It might be replied that the Festiniog Railway is a striking instance of the power to which narrow gauge lines can attain, and is the best argument that can be used to oppose the adversaries of the narrow gauge when they assert that these roads are not capable of doing public service on a large scale.

Having previously quoted the opinion of an English engineer, it will be of interest to know the opinion of a very celebrated French engineer, Mr. Sévène, director of the works on the Orleans Railroad, who visited Festiniog in 1870:

In his lectures at the "School of roads and bridges" he says: Perhaps the most remarkable of all the narrow-gauge lines is the road from Festiniog to Port Madoc.

The line traverses a most varied route. Thanks to its narrowness of gauge and its extensive curves, it runs along the sides of the steep mountain, and sticks (léche) to the ground almost without the assistance of embankments.

The superiority of the narrow-gauge is here made visible to the eyes of the most prejudiced, as regards the ease and economy of its instruction. It runs along the surface of the soil, across a country apparently turned topsy-turvy, where a line of the ordinary width could only go by means of extraordinary outlay.

The construction of the stations is very simple. The wagons being very low, no platforms are needed;

the buildings are of wood, and comprise an office for the Station-Master, with a trap-door for the tickets, and a waiting-room furnished with benches for the passengers.

To form an idea of the extent of business carried on by the Festiniog Railway, in spite of the simplicity of its organisation, we must study in detail a photograph of it which we reproduce below.

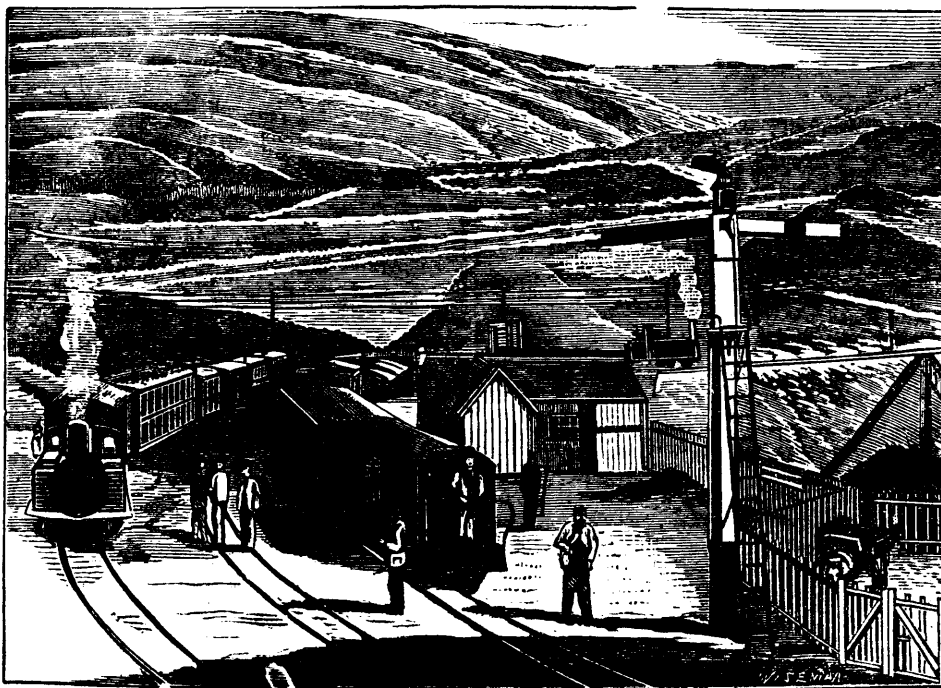
It is a picture of the most important station "Tan-y-Bwlch," in the middle of the line.

On the "shunting line" to the right, a mixed train of freight and passengers, which is frequently replaced by a passenger train composed of 10 carriages and an engine, and a train of empty freight wagons composed of 80 wagons and an engine, on the same line within the station, behind the other.

On the left hand "shunting line":

A passenger train descending, made up of 6 carriages and an engine.

The middle line is left free to allow a slate train to pass



Festiniog Railway.—Tan-y-Bwlch Station.

composed of from 100 to 110 loaded wagons, without an engine, which goes through the station without stopping.

The transfer-station of the Cambrian and the Festiniog Railways is at Mynford Junction, where the lines cross each other by one passing above the other.

The Festiniog is the higher road, and it has laid out a branch line which descends in a curve of very slight radius, and divides into three lines to accommodate itself to the gauge of the Cambrian.

The peculiar traffic of the line renders necessary three sorts of transfer.

First; for the slates; on account of their fragility, they are transhipped by hand, and to simplify the process, the level of the road has been arranged so that the sides of the Festiniog slate-waggons shall be of the same height as those of the great Cambrian ones.

Next; the coals; the transfer is managed by means of a turn-table, moving on two axes, which admits of one ten-ton Cambrian wagons being emptied into five two-ton Festiniog wagons, in five minutes.

For freight; the goods are wheeled on barrows from one wagon to another, the bottoms of the wagons being on the same level, and a travelling crane manages easily the loading of the heaviest packages.

The arrangement of this station may serve as a model for the most important lines; so we must not forget that all railroads transfer almost invariably their freight at the end of their network of lines; and those who oppose narrow gauge lines on account the difficulty occasioned by the necessity of transshipment when they cross a broad gauge, either deceived themselves knowingly, or sin through ignorance.

Having described the station, let us now look at the rolling stock.

When experience had proved the extreme strength of the carriages, they were built on the same model as those of the great companies; that is to say with the benches, or seats, like an ordinary vis-à-vis; but recently, the American cars

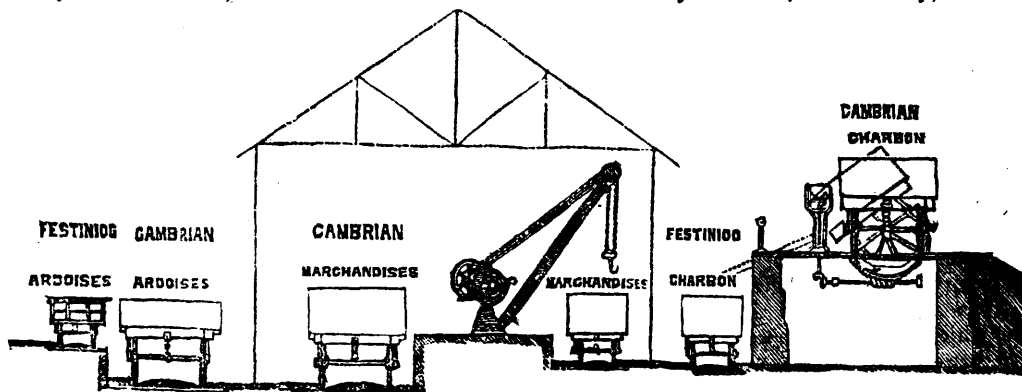
have been introduced, holding 50 passengers, (the others hold 12 in each compartment, 3 on each seat), but instead of the entrance at each end, with a passage in the middle, these cars

have 7 separate compartments. All the wagons have wheels of 45 centimètres, and are of steel. They run on greas-boxes, and spiral springs, and they are secured by a central tampon as are also the springs.

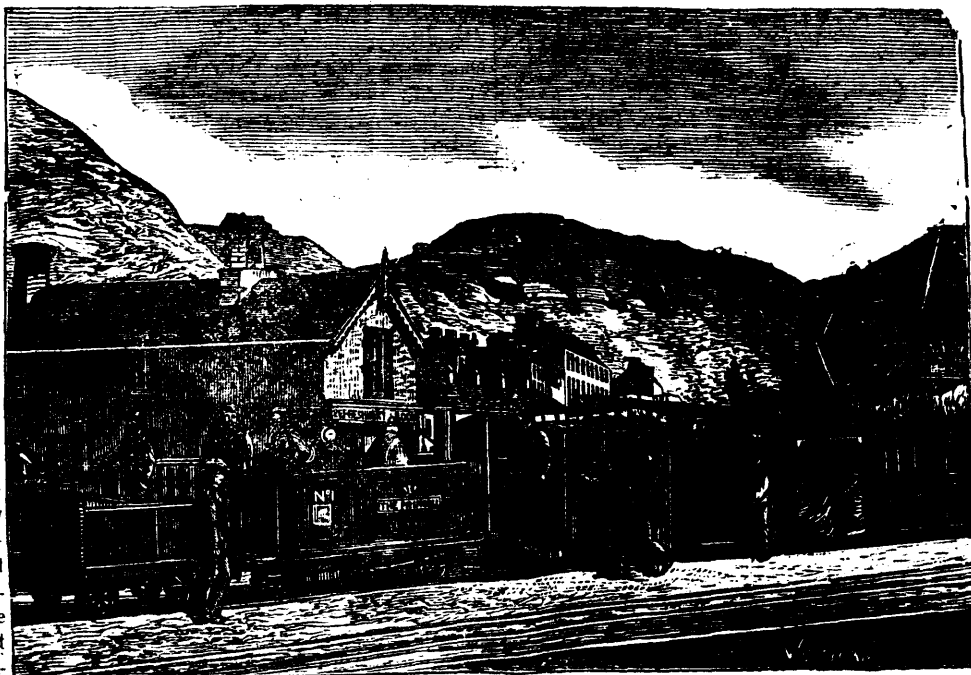
Few travellers by ordinary gauge lines of the second class are as comfortably situated as on the Festiniog railway, for the former frequently neglect their road, whereas the most perfect care of their line is as necessary to the Festiniog company, as the speed and the powerful draught of their trains.

A celebrated French engineer, M. Vignes, who was at Festiniog in 1877, thus expresses himself:

“ Thanks to the solid strength of the road and its careful, management we can say that no tremulous movement was felt in trains going at the rate of 40 to 50 kilometres an hour, not even a jerk of the coupling. We travelled often by the slate wagons, empty and full, up and down the slopes; they have no suspension spring; still there is no shock, and it is almost impossible to feel the passage



Mynford Junction.



The Princess machine.—Duffords Station.

over the joinings of the rails. Not the least advantage in this 23½ inch gauge, is the difference between the amount of paying and passenger freight drawn by each horse power, compared with the heavier engines on other line.

Thus the first car, back to back, weighs 1300 kilos and holds 14 passengers; the second sort weighs 1200 kilos and holds 12 passengers; the newest, the American, weighs 6000

kilos, holding 50 passengers, that is from 100 to 120 kilos per passenger of dead weight, whilst on the broad-gauge lines the dead weight, in first, second, and third class carriages, is respectively, per passenger, 250, 200, or 150 kilos.

As to the freight wagons, they are simple and strong, and well suited to the demands made upon them.

All the freight-wagons are mounted on grease-boxes (patent axles), but they have no spring check.

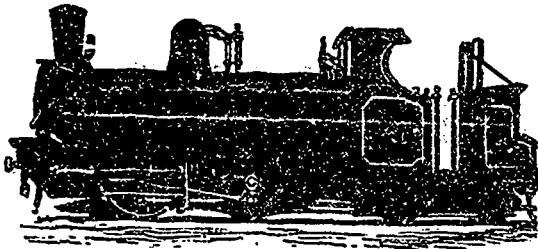
The *tampon* is of iron, with, underneath, a hook and chain.

The proportion of dead weight 300 kilos per ton, whereas on the broad-gauge lines it is 600 to 1000 kilos.

The two first locomotives, built in 1863, are the same as those employed by the contractors. The wheels are coupled, and the weight is 7000 kilos. We give an engraving of one, "The Princess," from a photograph.

Proving satisfactory, two other engines were built of like form the year afterward and allowed to experiment on the passenger traffic, which was carried on gratuitously for a few months. In 1868 two more engines were built, same wheels as before, but ten tons in weight. In 1869, the traffic increasing, a *Fairlie* engine was made with 8 wheels which drew much heavier loads, at a rate of 40 to 50 kilometres an hour. It weighs 22,000 kilos, and cost 50,000 francs; on account of its great weight, rails of 24 kilos a yard have been used.

To-day, the Festiniog line possesses 4 *Fairlie* locomotives, and still employs the 6 original four-wheelers; in all, 10 locomotives; and the gross receipts in 1877 were 692,000 francs, of which 126,825 francs were for 195,000 passengers, and 507,000 francs for freight.



Fairlie Machine.

No one can doubt, after this description, the existence and the prosperity of the Festiniog line, built of 23½ inch gauge, with ties of wood. In fact, this line can be put forward boldly as an example of success by all the promoters of narrow gauge lines.

All arrangements for building a line of this sort can be made, easily and rapidly, by applying at the workshops at Petit-Bourg.

The 0.60 can be built on the Decauville system with rails of iron or steel, of 7, 12, 18, or 24 kilos per metre, and all parts, for straight or curved lines, are sent out ready made, and fit to be laid down.

For a beginning in a new country, a trial of civilisation as it were, it were better to try the smallest of these plans, cost, about \$2,400 a mile. If a sufficient traffic should not arise, mules or small locomotives might be used, for local traffic, on the 7-kilogs rails.

If, on the contrary, this trifling outlay shall develop an increasing traffic, and oblige the proprietors to replace the 7 kilogs rails by those of 12 or of 24 kilogs, their consolation must be that the old rails have earned 3 or 4 times their cost, and we make them our compliments on the result.

This is indeed a question worthy of the attention of our legislators, as well as of all those who desire the development of our mines, and the colonisation of our country in the more removed spots.

Having studied this subject deeply, on the spot, we have

thought it only right to give a full account of it, in hopes that it may be taken up and freely discussed by the Press of Canada.

HAY.

The time will soon be at hand for one of the most important operations of the year. As long as our farmers persist in cultivating so small an acreage of land with root-crops, so long must their chief dependence for the keep of their stock during the winter be upon hay.

Now, what is hay? Dried grass, some will reply—yes, it is dried grass, but its value depends entirely on the manner in which it is dried, and the time at which it is out. It is not, like the cereals, valuable in proportion to the seed it contains. On the contrary the seed should never be allowed even to form.

The composition of hay, meadow and clover, according to Voelcker, is as follows:

	Clover.	Meadow.
Water	20.50	16.66
Oil, &c.....	3.59	5.01
Albumen, &c.....	5.00	1.81
Sugar, mucilage, &c.....	13.07	15.98
Digestible fibre, &c.....	16.42	28.88
Soluble inorganic matter.....	4.43	4.37
Insoluble protein compounds...	8.75	6.25
Woody fibre—indigestible....	25.62	17.64
Insoluble inorganic matter....	2.62	3.40
	100.00	100.00

Total percentage of nitrogen..	2.20	1.29
Equal to protein compounds...	13.75	8.06

It appears then certain that, as the danger is great that the starch, &c. will, if allowed to run their natural course, be converted almost entirely into woody fibre, which is about as digestible as an old calico gown, the grass should be cut as soon as possible after the full growth of those substances has arrived; that is, when the greatest amount of full bloom is visible over the whole meadow.

But now arises the difficulty; grass cut at this season cannot be carried into the barn in the afternoon, or even on the next day. It will take, even in the finest weather, three days to make, perhaps more, but, when it is made, it will be as superior to the ordinary trash, as wheat cut green is to whert, with its thick coat of bran, which has been allowed to stand till it is dead ripe. The people in the States have learned the lesson, long ago, and there is as good hay made there as in England. In Scotland, whence came most of our better farmers of the old school, it was a rarity to see, in my time, a decent stack of hay; the rye-grass was, like our *Timothy*, allowed to stand till ripe, in fact the seed for the next year was the produce of the whole shift, being very often, the grain shed from the hay into the bottom of the racks in the horse-stable.

Now though, of course, as an Englishman, I am full of prejudices, I will bring Mr. Stephens, a Scotsman, to back me in what I have just stated. In the last edition (1876) of his work, "The book of the Farm," a book which is beyond all comparison the most thoughtful and well arranged agricultural work in existence, thoroughly practical, intensely interesting, and one which ought to be in the hands of every young man who intends to make farming his business, he says: "It has been often alleged that Scottish Farmers show little skill in making hay. Ready as I am to vindicate the general excellence of Scottish husbandry, I own the allegation to be well founded. Instances of its truth are, delaying the cutting until it has passed its most succulent state; allowing it to lie on the ground when out: till bleached by the rain, scorched by the sun, or rotted by growth of the aftermath

through it... Every part of haymaking would induce one to believe that the time of doing it had arrived unexpectedly, and the thing must be got through in a hurry."

How often have I seen, in that gorgeously beautiful district of Compton, hay left till dead ripe, cut down by the machine, and lying exposed as the machine left it, in a thin layer, with the sun scorching it all day, and the dews blanching it all night, till the little succulence left was all drawn out of it; or else, if time permitted, carried to the barn in the afternoon, a sure sign that it had stood too long, otherwise the barn would be certainly burned to the ground by the heating of the hay.

As I have mentioned before, I have made hay for 15 years in the neighbourhood of that most difficult of all markets, London. I know (pray pardon my egotism) how careful the Middlesex, Surrey, and Kent men are about the manipulation of their crops of meadow and clover hay; and I know also that their plans are suited neither to our means, our climate, nor our markets. But is it not possible that an adaptation of these plans may fit our case? I think it is, and let us see if we cannot hit upon some such adaptation.

In brief, the Middlesex man begins to mow at 2 o'clock p. m., the grass being hardly in full bloom. Thus far, there can be no doubt the practice is applicable to both countries.

But now comes the trouble; the following day all the grass mowed yesterday, and up to 9 o'clock a. m. to-day, is tedded, hacked, wind-rowed, generally bedevilled, five or six times, and put up in grass cooks (very small ones); in fact the wind is wanted, more than the sun, to do the work of drying. *Theoretically*, all the hay should be made in the shade; *practically*, each blade of grass in the frequent turnings takes its share of affording shelter to its brother.

This goes on for two or three days, but is out of the question here. It makes perfect hay, but we cannot afford the outlay; our hay again is not meadow-hay, but generally Timothy and clover. Of course, I protest against Timothy, as I have already protested in this journal; believing that hay should not be our only winter provision for stock, I cannot think that a grass which will not bear grazing should be sown, except in combination with other more durable grasses.

How shall we treat our first crop of hay, consisting, as it generally does, of a large proportion of red clover?

If you will examine, as I do two or three times a week, the loads of first crop hay that are sold in the towns of this province, you will find that the Timothy and Clover, of which they are chiefly composed, are in this condition: the seed of the Timothy is fully formed, and the Clover consists of a stalk and a flower. You would not sow four or five grain crops in succession, those of you who are intelligent men; but you don't hesitate to let your meadows nearly perfect their seed year after year, and you think that is all right. Why, the cereals are only grasses, after all, with bigger grains than the other grasses! You can scourge your land by letting ten consecutive crops of Timothy ripen, just as well as by growing ten consecutive grain crops. You begin to see the one, but you are blind to the other.

But what earthly good can your cattle derive from the straw and head of the clover plant? Examine them, chew them, and your own taste will tell you, without a chemical analysis, that they are dry, "fizzleness," woody fibre. You can't, if you think a little, imagine for a moment that the few inchoate seeds you may gather from each head can be of any value! I declare, without affectation, that nothing gives me greater pain than to see, as I have seen, the magnificent crops of hay so lavishly given us all over the Eastern Townships more than half wasted by the neglect of precautions which the commonest thought would suggest.

Nowhere, in a not very short or untravelled life, have I seen finer crops; nowhere have I seen so much inferior hay.

How should this abundance of wealth be treated, to obtain the greatest possible value from it? We have the raw material, how are we to manufacture it to the best advantage? Suppose we have a crop of first year's grass, some Timothy, but principally Clover. It is clear that the more Clover is stirred the sooner it will dry; but there is another consideration; the more it is stirred the greater the number of leaves which will fall off. And here comes in our South of England plan of making Clover-hay, which is always worth from 20 s. to 30 s. a ton more than any other sort of hay: mow when in full bloom, let the swathes lie until the top is just wilted; turn the swathes, and let them lie until the fresh surface is wilted, and then get the crop into cooks, large or small, according to the state of hay and weather, but well made, and small a-top to throw off any possible rain; the hay will sweat in the cook, and in a few days will be fit to draw into the barn, (or preferably into stack), the Timothy will be green, and the Clover will have all its natural leaf closely adhering to the stem, which will be tender and succulent, instead of leaving the principal part of its value shed in the field, and utterly useless to man or beast. A. R. J. F.

Milk and its Products Versus Beef.

The time has come when we really must look things in the face. The "take it easy" kind of life, fearing no ill, but aiming at no great improvement, has lasted long enough. We are behind other nations in enterprise and activity, and he is no true lover of his country who would blink the question. "Provincial pride" has past into a proverb; unwillingness to learn, particularly from foreigners, is the recognized frame of mind of the colonist. We must get rid of this burden, always a slur on our character; we must work to live, and more than live, to save, and not, as we have been doing for years, rest satisfied with that sort of cultivation which enables us to earn a bare living with the least possible amount of labour and trouble.

Rearing and grazing cattle has always, and in all places, been looked upon as the easiest method of realising the produce of the soil. It takes a moderate capital, but of labour and pains, beyond careful inspection, very little. And the proceeds are, as might be expected, very little too. Besides it never seems to enter into people's heads, that all soils are not qualified for the same system of treatment. I do not speak without due consideration, without a great deal of experience, when I say that there are few, if any, acres of grass in our province capable of making a bullock ripe. I know I have never seen any.

You don't suppose that when the great Normandy farmers employ, as we lately saw they do, the rich "herbages" of the "Pays d'Auge" exclusively for fattening beasts, that they act without knowing their own interests, or when the Rothschilds and the Antrobases forbid the mowing of their rich grazing grounds in the vale of Aylesbury to their tenants under a heavy penalty for breach of covenant, that they are injudiciously severe in asserting their rights! and yet, a long side these grazing lands of Buckinghamshire, these "herbages" of France, lie other farms, equally rich in appearance, where the best butter in the world is made! But it is an established rule that guides the treatment of the different soils; it is no theory, it is pure empiricism in its true sense—the gain of knowledge by experience. And my experience, of nearly 22 years, leads me to this conclusion: that the main object of Quebec farmers should be to furnish, from their grass-land in summer, aided by the use of good nutritive prepared food in the winter for their late-calving cows, as much first-rate butter as can be made with the new appliances every where.

to be found; appliances which, a little trouble being taken to provide ice, will enable us to fight successfully against the rigours of our almost tropical heat.

For, let us compare the yield and returns of the two systems dairying and grazing; our season is short, say five months or five and a half; our stock of cows and bullocks may, for the sake of argument, be supposed to be in equal condition. What will be the difference on the 1st of November?

Now it is a very good steer that will increase on good grass 140 lbs. in the season; and it must be an animal of superior quality that will fetch 7½ cents a pound dead; i. e. the four quarters—that makes about \$10 for the summer's run, and the probability is that the bullock will not bring any thing like it.

Now take a cow—can any one dream of less than 10 quarts of milk a day for the first three months, and 7 quarts for the last? Well this makes 1340 quarts, equal, at 12 quarts to a pound of butter, to 112 lbs., which at 20 cts. a pound, and good butter is never unsaleable at that price, is \$22.40, (more than double what the bullock has realised) with, it is true, a little labour, but then only think what a miserable cow we have chosen as an exemplar! I might fairly claim 200 lbs. to 250 lbs. as the proper production of a good cow on proper pasture, even in the French districts; but I want to make my side of the question look as badly as I can, to be the more striking in its effects when people take the trouble to investigate it. I am morally sure that no bullock puts on 140 lbs. of meat in a summer's run; I am equally sure that no cow ought to make less than 200 lbs. of butter, and my readers all know that the skim-milk will pay for the labour of milking, churning, &c., if judiciously used, I have tasted, nay, I have made with my own hands, as good butter in this province, as ever was sent out of Normandy—it is quite a mistake to suppose that butter requires rich land; cheese does, but butter is no better for being high-coloured, as may be seen any day on the London markets, where the produce of the rich pastures of Epping is exposed for sale, and often brings an inferior price on account of its orange tinge and its excess of flavour—there is no fault in the dairy management, but the farmers in that district are now turning their attention to veal, the taste of the consumers of "best fresh" having become very critical.

I don't like to recommend any extension of cheese-making, for, at least, feeling, as I do, that we never can compete with the richer soils of the West in the markets of Europe. My own idea is rather different from the ideas of some good people, viz. that every farmer should grow every thing on his own farm! But then, you see, I believe in the science of political economy, and I am sure it won't pay the tailor to make his own shoes, or the man who farms land suited especially for wheat to devote himself to the growth of oats, rather than buy his oats of foreigners who can produce them and sell them cheaper than he can raise them himself. But I am conscious I am on dangerous ground, and, though with a very reluctant heart, I pull up.

A good mixture for our cold climate from November to May, for milk cows—cost about \$40 a ton, and quite as good as Thorley's food or any condiment at four times the price:

2 bus. wheat.....	\$1.40
2 " oats.....	80
4 " peas.....	3.60
1 " linseed.....	1.00
1 peck mustard.....	40

\$7.20

A sprinkling of Fenugreek will add flavour and, in delicate subjects, excite appetite.

ARTHUR R. JENNER FUST.

Stock per acre on English Farms.

It may be interesting to the readers of the Journal to know something about the amount of stock usually kept on English farms of the best description, and the amount of outlay necessary to the proper development of their productive capacity.

The entry on these holdings takes place at Michaelmas, the outgoing tenant retaining a right to the barns &c., until his crop is all sold; and the incoming tenant has to pay his predecessor for certain acts of husbandry, such as ploughing, fallows, land manured from which no crop has been taken, &c. These charges often amount, on the purely arable farms in the counties of the South, to from £6 to £8 per acre, a heavy pull on the tenants purse, it is true, but better and more convenient than the Scotch system of Whitsuntide entry. I may mention that, what is technically called a *folding*, that is, 4840 sheep sleeping one night on an acre of land enclosed by hurdles, is considered to be worth £3.10 and generally, three crops, wheat, clover (cut twice) and wheat, being taken after it without other manure, it is not too dear. The dung of the year and the straw are the Landlord's property, and follow the farm.

A tenant, it will be easily seen, having to pay for all this, cannot well and prudently start on a new farm without having possession of at least from £10 to £12 per acre. Even then he must not indulge in the purchase of "pedigree" sheep or cattle, in steam-engines, or other extravagances.

The rents, which vary from 3s. to £4.0 per acre, the one for poor sheep farms on the Chalk, and poor clays, the other for fine loams, are payable half-yearly; and, as the labourers are all paid in hard cash every Saturday night, the average cost being something between 35s. and 45s. per acre, per annum, the two items on a farm of 500 acres, will amount to something like;

Labour	£1000.00
Rent @ 35	875.00
Rates, tithes &c.	250.00

2125.00

All of which, the first year, except a little help from the sheep-flock, must come out of the capital, as, on the arable lands, no butter is made, hardly any profit from the fat bullocks, and there is a general dislike to threshing out the crop of wheat early in the season, as the condition, three years out of four, is not good until there has been a hard frost. Nothing has been reckoned in my estimate for artificial food or manures, the outlay for which often amounts to more than the rent.

On the mixed pasture and arable farms all these charges, except the rent, are much lower; and on the pure dairy farms, the rent is the chief expense, except the first outlay for stock. I take the following notes from the report on prize-farms competition, 1878, for the premiums offered by the Royal Agricultural Society of England, in the Bristol district. *Class 3.—Dairy and Stock Farms.*

For the best managed Dairy or Stock Farm of not less than 200 acres in extent, where the cultivation and management are directed principally to the production of cheese or butter, or of animal food, £30; for the second best, £15.

A. R. P.	
Red House Farm.—	54.3.25 Arable land.
	168.0. 1 Pasture land.
222.3.26	

Soil, light; subsoil, stone brash, i. e. a shattery, broken rock. The report of the judges states that the farm was in perfect order, the fences well kept, shelter for animals in winter, imperfect. Labour, about 30s. an acre, all the hay &c. produced on the farm consumed thereon, and a sum exceeding the rent expended in artificial food. Stock kept; 46 cows

in-calf, 3 barren cows, 11 two-years-old heifers in-calf, 13 yearling heifers, 13 weaning calves, and 2 bulls. Sheep; 127 breeding ewes; and, in May, 111 lambs, 53 fat lambs having been already sold, and 3 rams; each ewe having thus produced and brought up 1.21 lambs; a pretty fair average! The ewes are strong West-country Downes, crossed with a Cotswold ram, and "lamb and dam," are both fattened, none being kept for breeding. This year 1880 a good ewe of this description would fetch with her lamb something like £5 to £5.10. Seven sows, breeding twice a year, are also kept.

Taking the stock on this farm as cows, i. e. allowing 8 sheep to be equal to one cow, &c. it seems that it requires only 2.6 acres to feed a cow winter and summer.

The work is done by three cart horses; and, there two nags for the master's riding. Course of cropping on the arable land (1) roots, (2) wheat, (3) barley, (4) seeds. If, under such high cultivation, the barley with seeds were to follow the roots fed off by sheep, which is the real four-course shift, the grain-crop would inevitably go down, and smother the seeds.

To this farm the first prize was assigned.

Tunley Farm.—Arable, 100 acres; pasture, 284 acres; total 384 acres. The soil is described as heavy; subsoil, clay.

Liquid manure conveyed by pipes to a tank some distance from the farmstead, and used for irrigating lower-lying pasture-land. The returns for pork are large, as 200 hogs are fattened to an average of 200 lbs. each.

Stock: 92 cows and calving heifers, 24 yearling heifers, and 2 bulls.

Sheep: 45 ewes, 63 ewe tegs (lambs of the previous year Scottice, *hoggets*, Gloucestershire, *theaves*), 14 wether tegs, and 2 rams.

Pigs: 12 breeding sows and 147 pigs. Seven cart-horses and 4 cart-colls, 2 nag colts; a pony and a cob are kept for all sorts of work.

The dairy cows, particularly the young ones, as also the yearlings and weaning calves, are, according to the judges, a very superior lot, affording in their appearance ample evidence of the good results due to the use of pure *Shorthorn* bulls. Those at present in use are well-shaped animals of good quality, bred by Mr. Hugh Aylmer, of West Dereham, Norfolk.

Arable land course: (1) roots, (2) barley, (3) seeds, (4) wheat. One hundred and three acres of meadow-land, and sixteen acres of seeds were mown for hay. There were of the grain crops 31 acres of wheat, and 5 acres of barley, promising to be a great crop. Mangolds and swedes, 22½; a good plant, and the land clean and well done. Labour, about 30 s. an acre; cows milked by women, who are paid 3s. per week for milking night and morning. It will be understood that the word *pasture*, in England, does not mean a worn out piece of grass, and weeds, and brambles, but well managed greensward, that can be mown or fed at the will of its master.

This farm the judges thought worthy of the second prize.

An important observation is appended to the report, and is as follows: "A very large entry in the 3rd Class. The percentage of arable land is small, and as only about half of this is devoted to the growth of cereals, the produce of straw for litter is very small. Notwithstanding this, and the large number of cattle and pigs kept, the sweetness and cleanliness of the cow-sheds, piggeries, and yards, and the condition of the animals, we found to be all that could be desired.

CLASS 4.

For Farms like the above (class 3) but under 200 acres.

First prize — Kellaways Farm.—Arable, 26 acres; pasture, 100 acres. The tenant, Mr. John Long, employs 3 labourers at 15 s. a week, but, evidently does a good share of the work

himself. He is evidently a good workman, "as the trophies shown in the shape of silver cups for ploughing and other farm work amply testify.

The cattle in the farm are 38 dairy cows, a bull and 80 sheep, 2½ acres to each animal, taking 8 sheep to equal one cow. Four breeding sows are kept, and their progeny fattened and sold at about 200 lbs., in weight, each. The styes are well arranged, paved with brick, with gratings to carry the liquid manure by pipes to a tank; no litter is used, and the styes are kept clean by sweeping and washing. The liquid manure from this source is a wonderful fertiliser, its effects on the growing crops we saw being very good; it is pumped by a chain pump from the tank, and conveyed in barrels to the land.

The stock of horses consists of two cart-horses and one nag.

The arable land is cultivated like a garden, being perfectly free from weeds, and the management of the grass land is very good. All the beans and pease grown are consumed on the farm, and the value of purchased food exceeds the rent by about 50 per cent.

The decisions of the judges were arrived at after three visits, paid at unexpected times from January to May.

A. R. J. F.

The Aylmer Milk-Tank.

On Wednesday, May 12th., I had the pleasure of inspecting this arrangement, as suited to the requirements of a farm milking 15 or 16 cows. The frame, about 6 feet long by 4 feet wide, and 3 ft. 2 in high, is formed of wood lined with galvanised iron. The tank, which is covered, is pierced for 6 cans to hold 20 quarts each, the covers of which are pierced with small holes to allow any bad odour to escape. The ice is introduced by means of a trap-door at each end of the tank.

The inventor, guided by the true philosophical principle, that cold always descends, applies the iced water to the upper part of the pails alone; the lower third part of the milk being thus submitted to the action of the natural temperature of the air a continual motion is kept up by the falling of the films of cooled liquid, and the rising of the warm liquid, till a regular temperature is arrived at. This again must tend to throw off all animal smell. The principle is good, and resembles the "attemperators" so indispensable in the Brewery.

From what I hear from people whom I know well who have tried it, I think this milk-cooler, which is both cheap and commodious, is fairly entitled to a trial from all who are not yet fitted with a *Swartz* or a *Cooley* arrangement. It is certain that, if we wish to supply Britain with butter on a large scale, a very great change must take place in our dairy-work; cold water, iced or natural, *must* be used, as it is proved that by skimming sour milk we add cheese to our butter, and this climate will not admit of keeping milk unskimmed, in summer, for more than 12 or 16 hours; too short a time for the cream to rise.

Those who already make, or are thinking of making, their butter in the Devonshire fashion, should look at the "Aylmer Milk-Cooler," as the pails are of just the right height, breadth, and shape, for the immersion in the hot water bath. A specimen of the invention may be seen at Messrs. Larmonth & Sons, 33 College Street, Montreal. A. R. J. F.

Directions for using The Aylmer Tank.

The Tank may be set up in the corner of a room or cellar, as it occupies but little space. It requires to be firmly placed and as level as possible; it is then filled with cold water, and is ready for use. If running water be used, its temperature should not exceed 47°, and the Tank should have an overflow pipe to conduct the water away. The square openings in the top of the Tank are made to admit good sized lumps of ice, which must be used if there is no

running water, and it is well to remember that the colder the water, the quicker the cream will separate from the milk. Keep the Tank full, and keep the water cold. When the milk is first set in, it will melt the ice quicker than it afterwards would do.

The milk may be strained directly into the pails at the milking place, and covered. The covers protect the milk from flies, dust, &c., while they are so perforated as to allow all bad odours to escape. Carry in the pails and set them in the Tank, keeping them covered until all the cream has risen. Skim the cream with the tin saucer-shaped skimmer provided for the purpose.

The skimmed milk will be found perfectly sweet and sound, and may be carried away in the pails, which are then washed, and are ready for use again. Only one vessel to wash for every 20 quarts of milk set; no cream adhering to the sides of the vessel; no sediment mixed with it, and the perfect separation of the whole of the cream guaranteed.

My dear Sir,

I send you what has been about an average result of the test of temperature of water and milk made up at different times in experiments with one of my patent tanks last year:

Time.	Temp. Milk.	Temp. Water.
8 A.M.....	76° Fahr.....	45°
4 P.M.....	49°
8 P.M.....	Skimmed.....	44°
8 A.M.....	Film of cream only.....	46°

The milk was first set at 8 A.M. At 4 P.M., the water in the tank then standing at 49°, a little fresh ice was put in the tank.

At 8 P.M., twelve hours after setting, the cream was taken off, the water was then 44° with ice still unmelted.

It was allowed to stand again until morning at 8 A.M., when there appeared only a film of cream, too thin to skim off. The water was then at 46°. Experiments of temp. alone have been as follows:

Milk.	Water.	Time.
90° heated.....	40°.....	7 A.M.
71°.....	41°.....	8 A.M.
62°.....	42°.....	9 A.M.
55°.....	44°.....	10 A.M.

The milk in this case was reduced in temperature from 90° to 55° in three hours, the temperature of the water rising from 40° to 44° in the same time, no fresh ice being added. The temperature of the air at the time in the room was 57°.

The first hour the temp. of the milk fell.....	19°
The second hour the temp. of the milk fell....	9°
The third hour the temp. of the milk fell....	7°

And, after the third hour, the change of temperature was very gradual, the water becoming slightly warmer as the milk cooled. The ice melts rapidly at the first, but slower as the milk cools. Mr. Peplar states in one of his letters to me, that in July last, having ordinary spring water in the tank, he has found the milk in the pails perfectly sweet at the end of 24 hours, the temp. being at 90°, and the milk being sour and thick in his large pans, the same stream of water being used under them.

These experiments were, to my mind, very satisfactory, showing conclusively that the tank would fully answer the purpose for which it was intended, viz., rapidly to reduce the temperature of the milk in an ordinary tin pail, without being obliged to place the pail in the water. The cold is applied only at the sides. *Correct principle.*

Yours very truly,

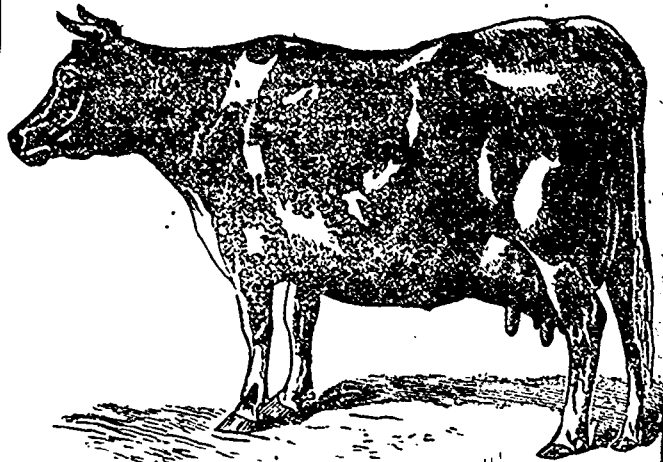
HENRY AYLMER.

Jersey Belle of Scituate.

Jersey Cow owned by Mr. Chas. O. Ellms, Scituate, Mass.

The Jersey cow represented by our cut, having achieved a national reputation, her likeness will be studied with interest by connoisseurs and fanciers of the breed. This being the case a slight criticism of the artist's work will not be amiss. He has represented her udder with less apparent fulness than shown in the excellent photograph which doubtless guided him. He has also made her horn too thick at the base, for

in the original it is fine and tapers nicely. Nevertheless the cut is a remarkably good representation of the anatomy of the cow. Her color is yellow, fawn and white. She will be nine years old this month. In point of breeding for the butter quality she could hardly be surpassed, having several crosses of the blood of the two noted cows imported by Mr. Thomas Motley, viz.: *Flora*, 113 and *Countess*, 114. Among the first cases of a continuous test for butter for any considerable length of time, to which our attention was drawn, was that of *Flora* above mentioned. In 1853 and 1854 Mr. Motley churned her cream separately for fifty weeks, and obtained an aggregate of 511 pounds and two ounces of butter. A detailed statement of the test has since been published in the first volume of the Herd Register of the American Jersey Cattle Club. We do not remember any like test of *Countess*, but both have long been regarded as excellent blood sources for obtaining rich milkers. It is,



Jersey Belle of Scituate.

therefore, not strange, if the maxim is correct that like produces like, that Jersey Belle, of Scituate, should have also prove a great butter cow, partaking as she does so largely of these two cows in her ancestry.

When Jersey Belle was coming six years old her owner, Mr. Chas. O. Ellms, of Scituate, Mass., determined to give her a similar test to that which *Flora* had undergone, and which had subsequently been exceeded by *Sutliff's Pansy*, 1019, she having made 574 pounds in one year. She calved Feb. 25, 1877, and commencing with her milk of March 5th, he patiently churned it separately for a full year. The cow gave at her height over 21 pounds per week, and held an average of 19 pounds for the first five months, and was yet giving one pound a day in the fore part of January, 1878. Soon after she fell off to a few ounces per day, but at the termination of her year had given 705 pounds of butter—a test that has not been exceeded so far as we have heard. She calved later that Spring, bringing her flush upon grass, and in a single week made 22 pounds 10 ounces, which is the best week's record that we know of, based upon actual results, churned and weighed; although *Darling's Eurotas*, 2454 approximates it closely, with 22 pounds 7 ounces for a week, and is now under test for a year, and within about 40 pounds of the corresponding mark reached by Jersey Belle at five months. Mr. Ellms values his cow very highly, and has steadily refused large prices for her and for her heifers, one of which, however, has been sold, and is in the herd of Col. H. S. Russell, Milton, Mass., who also owns a bull from *Eurotas*.

Am. Cultivator.

Yield of Jersey Cow Eurotas.

ESS COUNTRY GENTLEMAN—I have drawn off from the record at Darlington the yield of butter of the cow Eurotas, 2454, and present it in the same form as that of Mr. Motley's imported cow Flora, 113, in the first volume of the Herd Register :

Weight of Butter Separately Churned from the Milk of Eurotas, 2, commencing with the milk of Nov. 10, 1879, and ending with that of April 9, 1880,—five months:

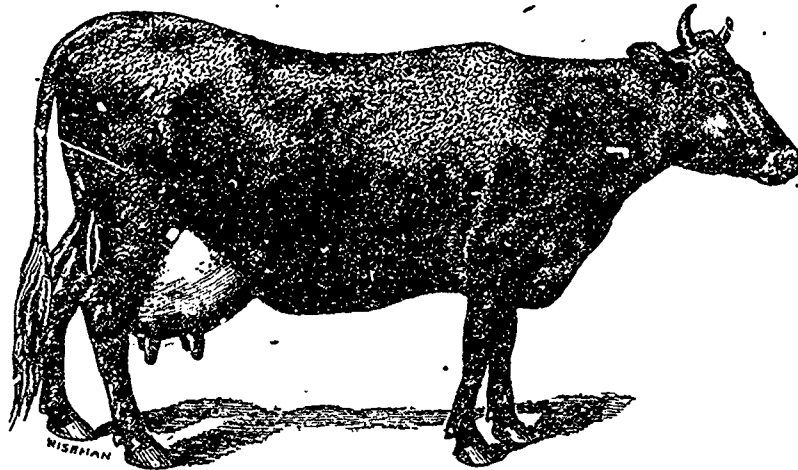
Date of churning.	lbs. oz.	Date of churning.	lbs. oz.	Date of churning.	lbs. oz.
Nov. 12.....	3 4	Jan. 1.....	5 0	Feb. 20.....	5 8
14.....	2 13	3.....	5 5	22.....	5 8
16.....	3 12	5.....	5 3	24.....	5 2
18.....	3 10	7.....	5 0	26.....	4 13
20.....	3 3	9.....	5 6	28.....	4 12
22.....	4 2	11.....	4 14	Mch. 1.....	5 1
24.....	3 12	13.....	5 0	3.....	5 2
26.....	3 14	15.....	5 2	5.....	5 3
28.....	3 13	17.....	5 6	7.....	5 3
30.....	3 13	19.....	5 1	9.....	5 3
Dec. 2.....	4 1	21.....	5 3	11.....	5 1
4.....	4 2	23.....	5 0	13.....	5 4
6.....	4 2	25.....	5 0	15.....	5 6
8.....	4 8	27.....	5 4	17.....	5 0
10.....	4 13	29.....	4 10	19.....	4 15
12.....	4 13	31.....	5 2	21.....	4 12
14.....	5 2	Feb. 2.....	5 4	23.....	4 2
16.....	5 2	4.....	5 8	25.....	4 12
18.....	5 8	6.....	5 8	27.....	4 8
20.....	4 8	8.....	5 8	29.....	4 10
22.....	5 12	10.....	5 9	31.....	4 2
54.....	4 10	12.....	5 8	April 2.....	4 5
26.....	5 15	14.....	5 5	4.....	4 0
28.....	5 5	16.....	5 5	6.....	4 3
30.....	4 12	18.....	5 8	8.....	4 8
				10.....	4 8

Total 364 pounds 15 ounces.

For the remainder of the month of April the churnings of two days' cream bring an average of 4 pounds 10 ounces, doing best at the last end, when she came up to 5 pounds. She is in calf since January 31, which brings her due in the year and practically limits her test to ten months. This would ordinarily promise a material shrinkage at about this date, but last year, on the contrary, she improved as pasture became good. Thus far she has had no grass to speak of. The above score is about 43 pounds less than that of Jersey Belle of Scituate for the same period, but the latter was in pasture, and finished her test in the winter months.

In order to reach 705 pounds in ten months, Eurotas will need to average 2 pounds 4 1/2 ounces per day until Sept. 10. It is believed that she far exceeded that last year, but as she has not shown her last year's capacity at any period since coming in, it would seem probable that she may also fall off earlier. When Jersey Belle made 705 pounds in a year, she was able to utilize the whole twelve months, not calving for fourteen months. With 43 pounds to overcome, and no allowance for two months, it would from the present outlook appear highly improbable that Eurotas will close the gap. The coming of grass may present a more favorable view, and her chances are not regarded as hopeless.

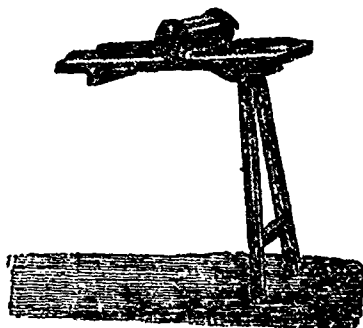
If she now succeed, it will only be by virtue of the same remarkable capacity she showed last year for holding out through the season. **HARK COMSTOCK**.—Country Gentleman.



Mr. A. B. Darling's Jersey cow Euratas.

Mechanical butter-worker.

I think the above engraving of *Ahlborn's machine* which took the first prize at Bristol, R. A. S. meeting, 1878, is one that may be easily copied by any carpenter, and would be very useful on our smaller farms.



It consists of a board 3 feet long by 10 inches wide. Each side of the board has a raised projection of about 1 inch in height; it is traversed by a fluted roller, having at each end a groove, which fits the raised projections on the sides of the board. The roller has projecting handles at each end; these are grasped in each hand, and the roller is moved backwards and forwards over the butter as it lies on the board. The end of the board next to the operator is supported by two legs; the other end rests on a tub. The legs are fastened to the board by hinges, and are folded under it when the machine is not in use.

A. R. J. F.

Horse Castration.

This is a subject of great importance to agriculturists and stock raisers. It is really astonishing to see that even educated farmers have so much confidence in those ignorant men who practice this operation. Undoubtedly there are some skilled operators among stock raisers, but I mean those ignorant quacks who kill, or hurt, half of the horses they castrate. Hemorrhage, tumefaction, inflammation, &c.,

come on, your valuable horse is stopped from growing for a long time, and is too often condemned to die. Farmers should do all in their power to have, if possible, their horses castrated by a Veterinary Surgeon, or at least by an educated, skilful man, knowing the anatomy of the parts he dissects in practising the operation. It would cost a little more, but they would be sure of the life of their animals.

The best method to castrate horses, &c., is undoubtedly the method of the "*Ecrasor*." By it, there is no hemorrhage, no swelling, no inflammation and no accidents whatever, neither is

there any subsequent trouble of removing clamps. We have never seen a horse die from this operation, when done with the *Ecrasor*, Mr. Robert Prentice V. S. says: "I have known many instances where the *Ecrasor* was used in castration for the first time, and the owners subsequently would have no other mode of operation performed, so highly pleased were they with its results."

If a horse should die after castration performed with the *Ecrasor*, we can safely say that he was attacked by some other disease, so sure is the method, especially when practised by a skilled hand.

The price of this wonderful instrument, "*Farmer Miles' Ecrasor*," is \$17.00 in England, about \$22.50 in Canada. Nearly every veterinary surgeon has it. Try them.

AGRICULTURE.

P. S.—"Mr T. C. Miles V. S., having during the last two years, travelled forty thousand miles in the United States, Canada, England, Ireland, Scotland and France; and having castrated in the Veterinary Colleges of Paris, France; London, England; Glasgow, Scotland, and

ance of spotting, and a delightful absence of all traces of the codling moth. The selection of varieties to make up collections was much better than heretofore, showing clearly that our growers are becoming better acquainted with selection of fruits for dessert, cooking, &c. Among the finest grown varieties were, Northern Spy, R. I. Greening, Fameuse, Baldwin, St. Lawrence, Duchess of Oldenburg, Gravenstein, Esopus, Spitzenburg, King of Tompkins County, Roxbury Russet, S. P. Griso, Ribston Pippin, 20 oz. Pippin, Hubbardson's Nonsuch, Hawthornden, A. G. Russet, Beauty of Kent, Porter, Swaar, Rambo, Wagener, Yellow Belleflower, Red Astrachan, Primata, Early Harvest, Pearmain, Bourassa, and many others. The show of pears was the largest yet held by this society, and quality has never been excelled in Huron. Everybody seems to grow the Bartlett, and one grower said if he were asked for the best selection of pears he would advise Bartlett, and stop there! His ideas are not carried out however, and hence we find about twenty good varieties freely grown. The show of plums was smaller than on some previous years, the cause of this being doubtless the fact that growers have ceased as a rule to fight the curculio. This is cowardice unworthy of a fruit grower, and we trust the cudgels will be taken up next year with renewed vigor. There is no better section of Canada for plum growing than ours, as the many large crops of previous years prove. We look upon it as the duty of every grower to fight the curculio constantly, trusting to the future to develop some enemy which may relieve us of the pest summarily, or that it may leave this section without giving notice or reason, just as other pests have gone before. Peaches made a fine show, but as yet the competition is confined to a few. The climate and soil of the Lake shore district is so admirably adapted to the culture of this magnificent fruit, that we only wonder large fields have not been planted out years ago. Now, however, local growers are planting freely, and with ordinary good luck, large crops can fairly be looked for. The varieties successfully grown at present comprise Early Crawford, Large Early York, Barnard, Foster, Early Beatrice, Alexander, and Late Crawford. In grapes we always excel, and this year was no exception. The competition as yet is confined to a few for under glass varieties, but in open air varieties the competition was very keen and wide spread. All the leading open air varieties are grown successfully. Mr. J. H. Williams continues to grow his seedlings—Nos. 1, 2 and 3—with promise of success. Garden vegetables were unusually fine and the display large. Our judges have done good work in making a careful selection of the finest grown table vegetables. We have seen the time that judges would often select the largest beet for the first prize, not so now—clear growth and make and fine quality is made the standard of excellence. So with all other vegetables; the decisions of the judges display more skill. Mr. A. McD. Allan has grown sweet potatoes for the past two years successfully in the open air, some of his specimens turning the scale at six pounds. He lays down the tuber in a hot bed, and when shoots of three inches spring up, these are broken off close to the tuber, and planted out in hills, or in drills. They should be planted out as early as possible, as the sweet potato requires a long season to reach maturity. They require a rich, well cultivated soil. The varieties grown were Early Peabody, Early Bermuda and Yellow Nansmond, the latter being the best.

TREE BROKERS.

This is originally an American "institution," but we have imported the pest, and find ourselves in possession of an evil equal in destructiveness to the curculio if not surpassing this much feared insect. Pity these creatures are not liable to an

attack of the yellows! We have often warned fruit growers in Huron to beware of all agents representing foreign firms, and especially these "dealers," indeed the only safety is in dealing only with some well known home firm. Messrs. Chase Brothers and Bowman, whose Canadian head quarters is at Toronto, belong to the class of "dealers" or "brokers," we are informed, and should be frowned down by all true horticulturists. Mr. O. D. Green, of Toronto, claims to have a large nursery at Waterloo, N. Y., but we find this is only in his mind, yet he advertises as a Nurseryman and we believe has agents representing him in the province. Mr. Charles Baker, of London, Ont., says by his card that he runs the Bristol and Montpelier Nursery at that city, he claims to be a professional budder and grafter. There may be something in a name, but when we look for facts they are not to be found. This pretentious individual was through this section and succeeded in going through some of our local gardens and orchards so thoroughly, that grape vines suffered more severely from his depredations than by all the other insects and pests put together; and his "professional" grafting and budding have turned out equally disastrous. From all "tree dealers" and "brokers" deliver us.

NOTA BENE.

In order to strengthen our hands and increase the usefulness of our Society we particularly request all interested in horticulture to assist us in our endeavors, by giving us information of tests of any description, of new fruits, flowers or other productions within the scope of our Society, diseases or remedies, and in fact all and sundry information that may prove of interest to horticulturists. We shall be glad at all times to take up points at our board discussions upon which any member desires information, and advise with any member to the best of our ability.

ALEX. McD. ALLAN, President.
PETER ADAMSON, Secretary.

The Duchess Grape.—This is a new variety of hardy white grapes very highly spoken of. It is said to mature with the Delaware, and, if so, it would do well in our warm, well sheltered gardens. We are giving it this year a trial, close by half a dozen of the best and earliest black grapes, and shall report progress. Messrs. Farley and Anderson of Union Springs, N. Y., supplied us with excellent plants of the Duchess grape, by mail. They sell at two dollars each, but will most likely be offered at a lower price next fall.

We read in American publications:—"The new seedling grape Duchess originate with A. J. Caywood, in Ulster Co., N. Y.

Another season has fully confirmed one's faith in the Duchess Grape: it has proved as hardy and as free from disease as the Concord, a stronger grower, and very productive.

There being no market grape of its color, size, hardiness, quality and productiveness, and from the many flattering testimonials which we have received from parties who have been testing it in different sections and soils, we feel confident that it will prove a valuable addition to our *Hardy Grapes*.

DESCRIPTION:—Bunch medium to large (often 8 inches long) shouldered, compact, berries medium, round, greenish white, skin thin, flesh tender, without pulp, sprightly, rich and delicious. It ripens with the Delaware, and as the Delaware ripens in some parts of this province so the Duchess may prove successful with us. We are giving it a trial and shall report progress.

POULTRY DEPARTMENT.

Under the direction of Dr. Andres, Beaver Hall, Montreal.

Keeping eggs fresh.

For whatever purpose eggs are intended, if they are to be kept any length of time they should be set up on end while fresh, some prefer setting up on the small end, and others on the big end; I prefer the latter. There is a difference in eggs.

Some will retain their freshness, and even hatch, at the end of weeks, kept in a careless manner, lying upon their sides; while others will "settle" in three days, in warm weather. The keeping qualities of the egg are proportionate to the health and condition of the hen that drops it. Eggs from overfat hens are never so perfect as those laid by hens in medium condition. A disposition to take on fat seldom appears the first year, hence the reason why pullets' eggs keep better others. The eggs from young hens have stronger shells.

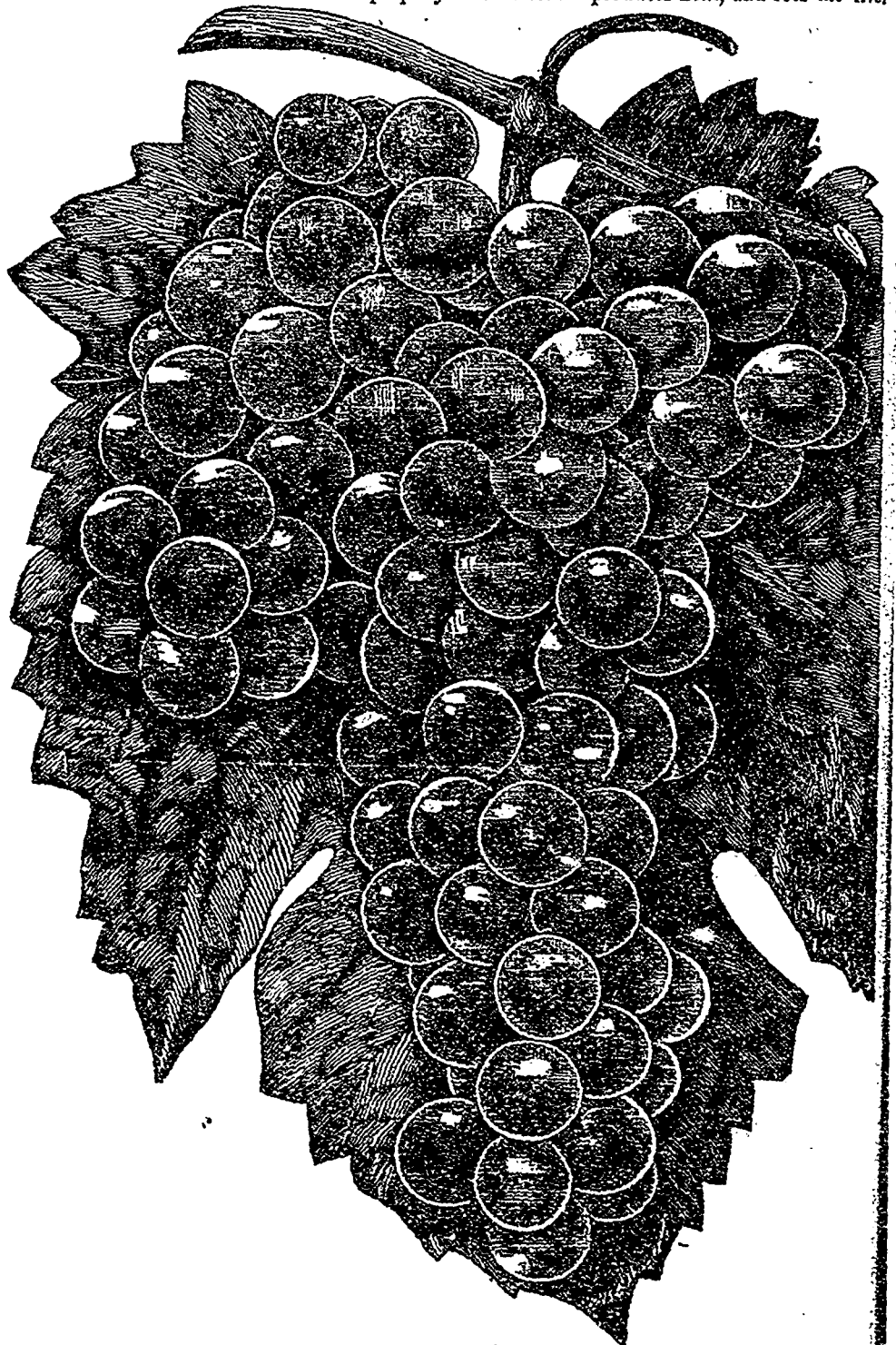
After fowls have passed their prime, there is a gradual disease in the vital strength and many weaknesses set in which we are powerless to relieve.

Fresh laid eggs sometimes have dark spots in them which may be visible through the shell when examined against a strong light. Open the egg and there will be found on the yolk sometimes detached, but often fastened to it, a spot, as large as a pea, of dark crimson blood. These eggs will surely spoil. The hen may have received an injury; at any rate the blood is making an effort to carry off the trouble and will do so with the assistance of good food and healthful drink. In the course of time such eggs will turn black, sometimes fill with a fungus-like material, solid in texture, and though not actually putrid or rotten, will have a disagreeable odor or smell, like fungi. The shells will be found imperfect, with soft, porous spots. I have known this to occur with five or six eggs of one hen in succession, after

which they would come good. The hen was old, and had been a remarkable layer when a pullet. It is important that eggs for hatching have good shells, and to secure this the fowls must be young and healthy.

It perhaps is known to few that fowls suffer from disordered livers.

Nine-tenths of fowls' diseases arise from this cause. Fowls that have passed their maturity take on an excess of fat, if not properly fed. This fat produces heat, and rots the liver



THE DUCHESS GRAPE.

consequently the fowl dies. A change and variety of food are necessary to health.

Egg production opens an avenue for the surplus material, after the support of the blood and live fat is created. A rapid circulation of the blood, and a lively action of the liver, keep the fowl in health, and, when dropping eggs frequently, this action of the system is kept up, and consequently the fowl thrives. The dormant bird that takes a ration of corn twice a day produces fat, which after a certain extent, is rather a damage than profit. It is a mistaken idea of many that a cock must accompany the hens at all times, in order to produce eggs. Hens lay quite as well without as with, and for market eggs should never be allowed to consort.

When a valuable cock is permitted to associate with many hens, the fertilizing power is greatly weakened, and if long accustomed to this strain of vigor, he will take no notice of his mates. Hence the small percentage of eggs that hatch. It is a moot question how long the fertilizing power continues in the absence of the cock. I think three days, or the third egg, with the hen. The fourth egg may possess weak vitality with some breeds, but not sufficient to produce a strong chick. I am not certain on this point. There are variations with different fowls. Some hens' eggs will never hatch, although allowed the freedom of intercourse with the male. They may be good layers, healthy and strong, and the eggs apparently perfect; but from some freak of nature, or through the medium of some disorder, the organs fail to perform their office.

With the turkey it is different. One contact with the male is sufficient to impregnate the whole clutch, unless it be unusually large, say 16 or 20 eggs.

With the rapid, long-laying breeds a smaller percentage hatch than with the sitters. With the migratory birds, there is never any mating after the first egg is dropped.

Country Gentleman.

Prepare your green food for winter.

Another winter will soon be upon you, and you should prepare for it by providing during the summer such things as potatoes, cabbages, onions, or turnips, for your fowls: during the warm season: if they are allowed their liberty they do not need them. Grass, vegetables, and insects, are in plants, and they gather up much that they were deprived of during the winter, when everything is shut out from them, and their discomforts commence all at once.

We fear that there are very few who think it necessary to give green food to their poultry; but, if you would have your fowls do well, give it them. They will lay better, feed better, and do in every way better when they get a generous supply of vegetables with their other daily food.

Dorkings—What do you feed them with.

In commencing this article it will be as well to go through all the different foods, giving the merits and demerits of each.

Barley is commonly thought to be the only food that fowls can possibly require, and many wretched birds are shut up in a small yard with nothing but a scanty allowance of this grain, and, to their owner's astonishment, do not pay. Fowls may be truly said to be omnivorous; they will eat and enjoy green food, grain, seeds, insects, worms, and a thousand things we wot not of. They also require access to a heap of lime rubbish, which is to them what salt is to us, besides helping to form the egg shells; and in addition to this they *must* have a supply of small stones to grind it all up with, gravel in the gizzard performing the same office for them that teeth do for us.

It will be at once seen, that however good barley is, it is insufficient by itself to keep birds in good health, and it

almost amounts to cruelty to try to do so. For an occasional food it is well enough, but in my opinion is not equal to wheat.

The best wheat is at the present time selling at about 5s. 6d. a bushel, and at this low price is by far the cheapest and best food we can use. I do not approve of tail or offal wheat, as I am sure with all grain the refuse, though low-priced, is by far the dearest in the end. It is very well for a farmer to use such stuff, for it costs him nothing, but to buy such rubbish is a great mistake, more especially in barley, the lightest of which is all husk, and has no kernel. Good wheat, then, is my idea of a food, and one of which the fowls are particularly fond. They lay and do well upon it, and I think no one can err in giving their fowls one feed a day of it.

Peas and beans are not generally used for fowls, but I can strongly recommend them. White peas are the best, and the beans should be cracked in a kibbling machine. They both form a capital occasional food for laying stock, and will bring the birds into splendid feather. They must not be given in excess, nor to chickens which are intended for the table, as they will make the flesh very hard and tough; but as old cocks and hens are generally pretty much this way already, no harm can be done them.

Maize, or Indian Corn, as it is called in England, is a large yellow grain, of which fowls are particularly fond. There are two sorts—large and small, the latter the most expensive. Maize is at the present time rather dear, and I do not recommend it, except for an occasional change once a week, and then not to the white-feathered birds, or it will most certainly turn their plumage yellow. Some people may laugh at this idea, but such have only to see what cayenne pepper will do for Canaries to be at once convinced. Maize is fattening, but is not a good egg or flesh-former, so it is one of the worst foods for growing or laying stock; but it claims one merit—the Sparrows can not possibly swallow it, nor can it be trodden into the mud, and for this latter reason I generally have it used in wet and dirty weather.

Oats will be relished for a change, but they must be sound and heavy, or the fowls will not eat them. White oats are preferred, and they should not weigh less than 39 lbs. to the bushel.

Rice I never use, and though apparently cheap, it will be found very dear in the end, as there is no "heart" in it.

Buckwheat, a small dark grain very much like hemp-seed, is strongly recommended by some, but I could never get my birds to eat it: I have tried it several times, both for old birds and chickens, but it has always ended in waste. I daresay the fowls would eat it if seen, but none are so blind as those that won't see, and my birds seem determined not to see it even when laid on a white plate. A very little hemp-seed is not a bad thing in the early part of the year to start the hens laying, but if given in excess it is too forcing, and will cause them to lay eggs without shells. If given in the moulting season, it is said to cause the new feathers to come in a darker colour, but as to this I cannot speak from experience, for I don't use above a quart of it in a whole year.

Grain ground up into meal and slacked with water—soft food as it is called—should be given to exhibition birds at least once a day, as, though a little troublesome to manage, it will be very advantageous to the fowls. In cold weather it should be mixed with warm water into a crumbly mass, and if given warm on a winter's morning will greatly promote laying. I always use a zinc bucket and an iron spoon to mix it, first pouring in a little water, and then the meal; if properly prepared it should not be sticky.

Ground oats are generally considered to be the best staple food, and my own birds have one feed a day of them all the year round. It must be borne in mind that ground oats are not

the same as oatmeal, but the whole grain ground up, husk and all; it is very difficult to obtain good, and I send nearly 50 miles for it, but I am convinced that this extra expense is not money thrown away. When good it looks rather like coarse flour, and, mixed with water, should not show much husk.

Barley-meal by itself is too sticky, and clings to the birds' bills, but if mixed with fine bran (sharps as it is called) it will answer very well: I sometimes mix it with ground oats, but fine bran will do equally well, and is much cheaper.

It will be seen from the above list that there is plenty of choice, and the oftener the diet is varied the better will the birds prosper; but it must be borne in mind that Dorkings fatten more readily than any other breed, and if we wish to keep them in good health they must not be over-fed. In winter they may have almost as much as they will eat, but in summer they should be kept very short, especially if they have a grass run.

Some green food is absolutely necessary; if not to be obtained in their yards they should have some given them daily—a Mangel-wurzel is the best thing I know of, especially as the roots are very cheap, and will keep all through the winter. They should be chopped in half, the fowls will very soon eat the heart out of them.

My own Dorkings are fed twice a-day—early in the morning, and the last thing before roosting time. In addition to this I usually go round the yards at midday with a pocketful of corn, and throw them a few grains while I see that they are all as they should be, and it will be well to bear in mind that "the eye of the master makes the horse fat."

One word as to purchasing food—if it is hoped ever to make fowls pay, the grain and meal must not be bought in small quantities, but should be purchased by the quarter or sack. Some friends of my own insist on purchasing it by the gallon, the result being that their birds often have none at all, and what they do have costs twice as much as my own.

Very little need be said on the score of drinking water, save that it should be changed every day, and is best kept in iron vessels, as the latter are not easily broken, and, if a little rusty, will give a chalybeate taste which will be very beneficial. For a number of fowls an iron pig-trough will answer very well, while what are sold as dog-dishes will do very well for a few.—By T. C. BURNELL, in the *Cottage Gardener*.

How I Cured Roup.

On the morning of the 25th ult., as I went among my Black Cochins to give them their first feed of the day, I noticed in one of my pens of cockerels that the very best bird I had was seriously ill. His head, face, and even wattles, were badly swollen, and a rattling in the throat that could be heard twenty feet away, convinced me that I had before me a bad case of roup. He could hardly stand, and in his feeble attempt to get away fell over as I picked him up. I took him to the house, gave him a room (after first putting him into a coop) and administered a dose of coal oil.

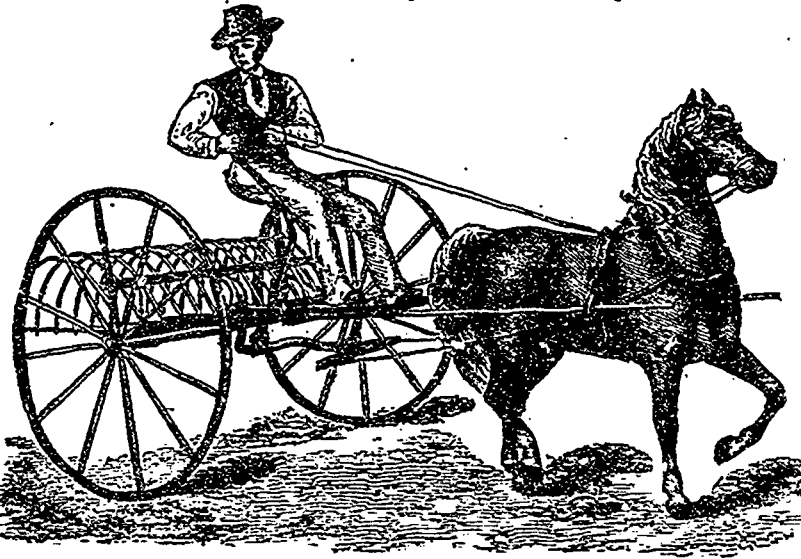
In about an hour I made a strong soap suds of Castile soap and very warm rainwater, and getting a soft piece of Canton flannel cloth, I washed out his mouth and throat thoroughly; putting the cloth far down his throat, and allowing him to swallow most of it, then gently drawing it out, I would extract strings of membranous matter similar to that which suffocates children when they have the croup.

His throat seemed to be very raw and tender, as the cloth was repeatedly covered with spots of blood. After thoroughly washing his mouth and throat, I gave him a tablespoonful of hive-syrup and then greased his throat, mouth, head and face with Trask's Magnetic Ointment, and put him in the coop. At night I examined him, and could see no change in his condition, only the matter in his throat seemed to be softer. I gave him another dose of hive-syrup and left him to his fate. Next morning the rattling in his throat had almost disappeared, and his mouth had a more natural appearance, and the stanch, which was terrible before, was not half so disagreeable now. I repeated the throat wash as before, and he seemed to rather enjoy it. I also repeated the greasing process, and offered him food, but he still declined to eat anything. I left some sweet milk with him but when evening came I noticed he had not touched it. Still I was encouraged, for the rattling in the throat had stopped, but his head and throat were badly stopped yet.

I gave him another dose of the hive-syrup, and greased him again thoroughly. Next morning he was standing, rather feeble to be sure, and I saw that he would get well if I gave him a chance. So I washed his mouth and throat out again with the Castile soap and soft water as before, and greased him again, and offered him a feed of light bread and warm milk, which he greedily ate.

I doctored him that night, and early the next day I heard his familiar, long-drawn Cochins crow several times, and saw that the swelling had gone down. I gave him a feeding of soft food and placed him in his old pen where he immediately took command

of all the cockerels, and where I am now "showing" him along for the winter exhibitions.—C. I. FORSYTH, in *American Poultry Journal*.



Cossitts Horse Dumping Lever Rake.

application of plaster on the leaves gives the plant an additional strength.

We see no danger from this application, as the quantity of Paris green is exceedingly small, one to fifty of Plaster, and as the fruit is just forming. Were the fruit more advanced, say within three or four weeks of ripening, we should not use the poison.

We bespeak for Messrs. Lyman, Sons, & Co. the encouragement they deserve. Their mixture will save our potato and fruit crops at a trifling expense just about the true retail price of good Paris green and plaster.

There is every appearance of an increase quantity of potato bugs this year. We have already found several couples on each stalk of potatoes, but the mixture has caused their entire disappearance, for the present at least.

Death to Potato Bugs.

We have just tried Messrs. Lyman, Sons, & Co's mixture of Plaster and Paris green on our gooseberry bushes. The worms withered immediately under a slight application on the leaves. A few hours later they lay dead. As to potato bugs, this mixture is sure death to them and their larvae. Moreover the

The Hay Harvest.

Our readers will find in this number an excellent article on early made hay which every one should read. We here represent two good rakes which can be recommended safely to all in want of such implements.

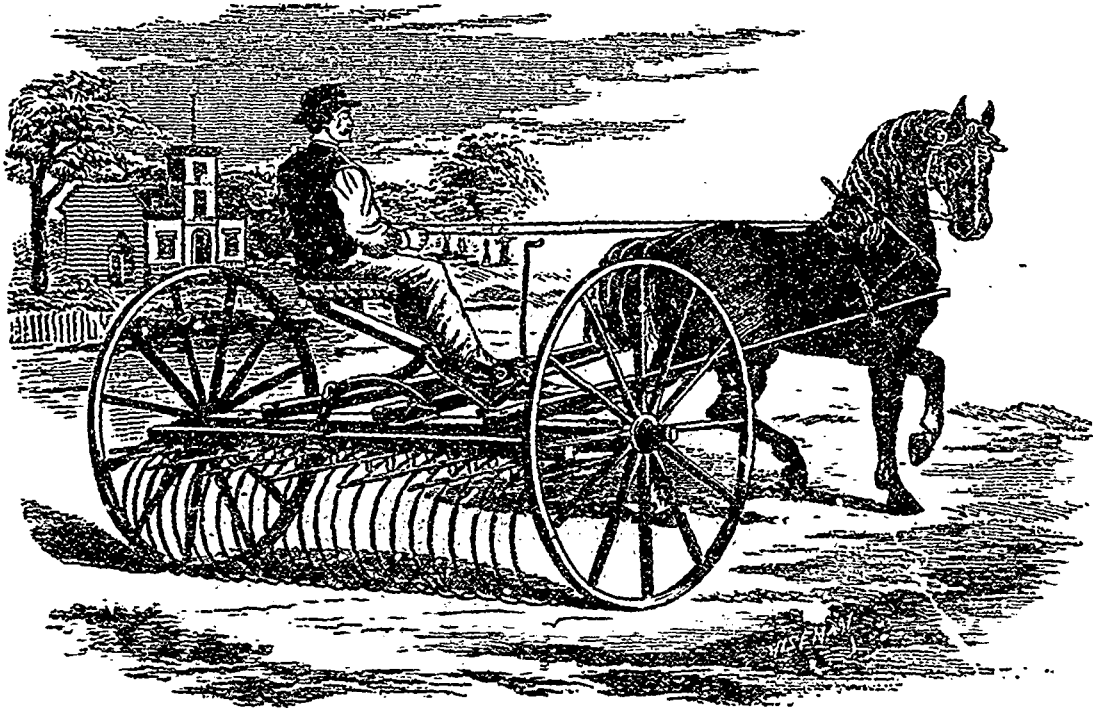
Cossitt's Horse Dumping Lever Rake.

The Ithaca Horse Rake with Cossitt's Patent Horse Dumping Lever is made only by Messrs. Cossitt & Bro., Brookville, Ont., and of Montreal, Quebec, samples can be seen with Local Agents in every County or Parish; price \$30 00. The Rake has 24 steel teeth, and is guaranteed for one year. Address all correspondence to R. J. Latimer, Cossitt's office, 81 McGill Street, Montreal.

CORRESPONDENCE.

The following interesting communication will no doubt be read with advantage.

FAIRBANKS'S CREAMERIES. — Our system is coming into favor in the west, and beginning to attract some attention in the east—as we have several factories now starting in Penn., Ohio, N. Y. and Mass. The advantage of the system is in the saving of hauling milk to factory, and in producing a fine quality of butter. We have a special feature in our can, viz. the centre cooling tube—with small tube extending out through the side of can—this makes a circulation of water through centre of milk, while the milk is cooling—(can being set in water). By cooling milk in this way, we find that the odors and flavour, caused by improper feed and bad water, are driven out of the milk, that is, it passes out through top of can (same being open while milk is cooling) and as it passes off through warm milk or cream, it does not stop, or condense in the cream, and taint the butter. In the common setter, or straight can, the milk cools from sides to centre, and as the top cools, (it being exposed) the odors condense in the cream (or top milk and cream) and taint or flavor the butter, the top cream and milk in our can is kept warm by the heat of the milk being driven up



Frost & Wood's Hand Dump Horse Rake.

Frost & Wood's Hand Dump Horse Rake.

The Ithaca Hand Dump Horse Rake is Manufactured by Frost & Wood, Smith's Falls, Ont. It is built of the very best seasoned timber and has 24 Oil tempered teeth.

It has also a Foot Lever to assist in dumping and can be worked by any boy, who can drive a horse; it is as easily operated as any self dump rake and not liable to get out of order, a similar Rake with Self Dump attached took 1st Prize at the Dominion Exhibition at Ottawa, in September last. Price \$28.00 for Hand-Dump, and \$30.00 for Self-Dumping Rake. The Messrs. Frost & Wood are represented by Messrs. Larmonth & Sons, 33 College Street, Montreal.

ward. We have creameries running with 200 patrons; the cream is delivered to factory by teams, from all sections, or different routes-tributary, and placed in 600 gal. vats, and we have yet to find any tainted butter. The farmers set the milk under directions given by the cream collectors, and receive pay according to the amount of cream furnished, or raised on can; well water is mostly used, as springs are not abundant on our prairies. Milk set at the dairy will produce 1/2 lb. to 3/4 lb. more butter per hundred of milk, than it will by factory setting, the carting of the milk seems to injure it for cream raising.

The farmers value the skim milk at 20c. per hundred, saving in hauling 8c., so it gives cheese a close call. We have factories hauling cream a distance of 22 miles, by making a cream depot half way, and running teams to that point.

For any further information please write me and I shall be pleased to serve you.

Yours truly,

C. C. FAIRLAMB.

SHELL MARL.—You will receive with this a sample of what seems to me to be "Shell Marl" (*de la Marne*). It dissolves well in water, as "fullers' earth." Some is more sandy, is supposed to be "*Marne Siliceuse*;" the presence of remnants of small shells, leads me to suppose it is what is called "Shell Marl."

My object in sending it to you is to request that you will kindly test, examine, and ascertain what kind of Marl it is, or what affinity it may have with the phosphate of lime, now in so great repute. Also if merely an ingredient to improve the land, or a manure, or both; and lastly would it pay the labor of digging it (water is shallow, and haul it a distance of 3 or 4 miles)?

The above particulars might be the subject matter of a good article for the April number of your "Journal of Agriculture,"—but should that not come to us before the breaking up of winter roads, then I would request (and be very thankful for a few lines meanwhile) saying whether it is a manure and hence would pay labour of digging and hauling for the coming season, by so doing you will oblige several Agriculturists.

New Carlisle.

V. WINTER.

Answer—The sample sent is of the very best Marl, being nearly pure lime. Should the neighbouring soil want lime, and most of our cultivated soils do, it should no doubt pay to haul this marl.

However, a few loads, spread here and there in different fields, would solve the question of profit.—Marl is best applied in the fall, or in winter, on land previously ploughed. It would not do to plough it in, as such action would place the larger portion of the lime too deep in the soil, and its benefit would be lost.—The quantity to be applied per acre depends on circumstances, and can be best ascertained by experiments on a small scale (1).

Marl is best placed on the field in small heaps, in order to have it dissolved into fine powder. It should then be spread with a shovel. The best time to do this is immediately before harrowing. It will be found specially useful in the cultivation of wheat or barley; and whenever grass seeds are sown Lime will show its good effects sooner on the latter than on most other products, altho' it forms an important constituent of all our crops.

Phosphate is an entirely different product, being valuable in proportion to the phosphoric acid it contains in combination with lime.

What we have said of *marl* and of its usefulness applies equally and to a greater extent to lime. Farmers in this province have not, as a rule, sufficiently experimented with the use of lime on their fields. In most cases, liming would be found particularly useful and profitable. An application of from four to twelve barrels of unslacked lime, applied as stated above, would generally, prove one of the best possible investments in all our old settlements.

(1) In Norfolk and Suffolk, England, about 8 to 12 cart loads of *marl* are applied every 4 years, after the first heavy dressing of 40 or 50 loads. In Scotland, on heavy lands, 200 to 250 bushels of quick *lime*. In Kent, 40 to 50 loads of *chalk*, spread in winter for the frost to act upon it, and then ploughed in. These quantities are *per acre*.

AYRSHIRE CATTLE.

BULLS, COWS AND HEIFERS.

As entered in Canadian and American Herd Book.
For sale cheap,

JOHN L. GIBB,

Compton, P. Q.

MONTREAL VETERINARY COLLEGE, ESTABLISHED IN 1866, BY THE COUNCIL OF AGRICULTURE, P. Q.—In connection with the medical Faculty of McGill University.

The course embraces Botany, Chemistry, Physiology, *Materia Medica*, Anatomy, Veterinary Medicine, and Surgery, it extends over three sessions of six months each.

Lectures commence on the 1st October and continue till the end of March.

The Council of Agriculture offer twenty free Bursaries, 7 for the English department and 13 for the French; these are intended for young men from county districts only. Applicants must be recommended by the Agricultural Society of their district, and pass the matriculation examination.

Prospectuses giving full particulars for intending students will be sent free, on application to the Principal.

D. McEACHRAN, F. R. C. V. S.
No. 6 Union Avenue

FOR SALE.—SEXTON, THOROUGH BRED Station, formerly owned by F. W. Kay, Phillipsburg. Sexton is in color a dappled bay, 10 years old, stands 15 hands, 3 in., and weighs about 1225 lbs. Those wanting such an animal should see him and his colts. For pedigree and other information, apply to **CHARLES GIBB, Abbotsford, P. Q.**

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MONTREAL HORTICULTURAL SOCIETY and Fruit Growers' Association of the Province of Quebec.—All persons desirous of becoming members of this Association (not resident on the Island of Montreal) may do so on payment of an annual fee of **One Dollar.** The payment of this sum entitles the member to a copy of the Illustrated Annual Report issued by the Society, a ticket of admission to the Annual Exhibition, and he is also entitled to compete for any prizes offered by the Society without any further charge for entry. All persons subscribing for the present year will receive a copy of the Illustrated Report just issued gratis. **HENRY S. EVANS, Sec.-Treas. P. O. Box, 1976, Montreal.**

VILLAGE DES AULNAIES NURSERIES, St. Roch des Aulnaies, Co. Pislet, P. of Q.,

AUGUSTE DUPUIS, Proprietor.

Keeps a fine and large stock of Fruit and Ornamental trees, shrubs and roses, specially adapted to the colder parts of Canada. Catalogue free.

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The Subscribers have made arrangements to supply farmers and other interested with **Pure Paris Green, READY MIXED WITH LAND PLASTER,** thus obviating the trouble and danger arising from mixing where there are no facilities for doing the work properly. The mixture has been carefully made at their Mills from **Pure Paris Green** and specially prepared and finely ground **LAND PLASTER,** and is put up in barrels containing 300 lbs. Price in barrel lots: \$3.00 per barrel; in small quantities, 1½c. per lb.

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