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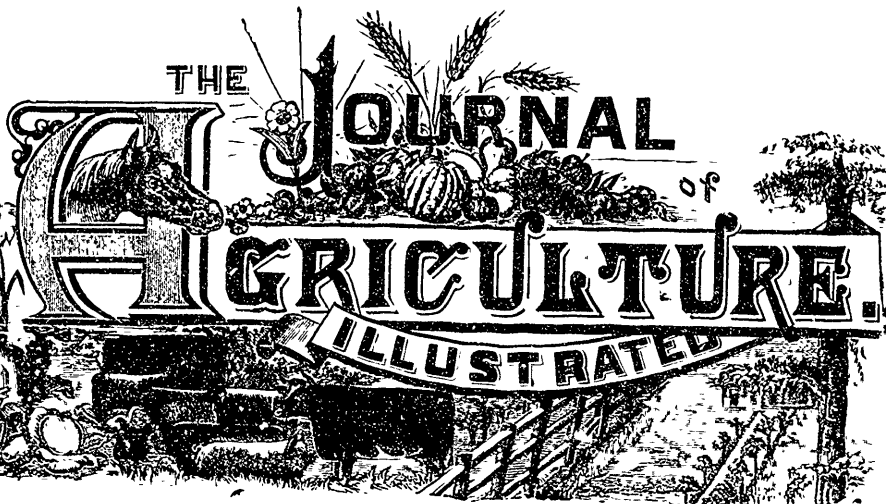
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NOTICE.—The subscription to the *Illustrated Journal of Agriculture*, for members of Agricultural and Horticultural Societies, as well as of Farmers Clubs, in the province of Quebec, is 30c annually, provided such subscription be forwarded through the secretaries of such societies.—**EDITORIAL MATTER.** All editorial matter should be addressed to R. Jenner Fust, No. 1 Kinkora Avenue, Dorchester Street West, Montreal—or to Ed. A. Barnard, Director of the *Journals of Agriculture, &c.*, Quebec.

OFFICIAL PART.

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Pure bred Pigs and Sheep.

Breeders of pure bred pigs and sheep are hereby requested to send to the undersigned, as soon as possible, certificates of registration of all pure bred pigs and sheep registered or descending from stock registered either in Great Britain or in America. These certificates will be entered in the Provincial book of registration, now being opened and returned without delay.

Breeders are also requested to inform the undersigned of the lowest price they would take for such stock as they first to sell, in order that this information may reach the readers of the Journal who wish to purchase.

ED. A. BARNARD,
Secretary Council of Agriculture.

FERTILISERS.

Our makers and mixers of fertilisers must make up their minds this season to fit the prices and values of their products a little more in accordance with the prices of the crops the growth of which they are intended to promote.

I have just received the First annual Report of the Experimental Station of the Province of Quebec, and I am happy to see that as regards the relative prices and values of the Capelton mixed fertilisers, M. Choquette, the Chemist in-

charge, and I arrive at nearly the same results; the trifling difference between our valuations being due to my having taken the *average* of the analyses of the manures quoted in Mr. Nichols' circular, whereas M. Choquette bases his on the actual contents of the samples submitted to him by the manufacturer.

(Compare the two sets of valuations: (v. Journal March, 1890, p. 44.)

RELIANCE BRAND.

Ammonia 2 per cent.....	2	× 13	× 20 = \$5.20
Available phosphoric acid 6½ per cent. 6½ × 7 × 20 =	6½	× 7	× 20 = 9.10
Potash 2½ per cent.....	2½	× 4½	× 20 = 2.25
			\$16.55

Selling price—\$27.00—Difference..... \$10.45

VICTOR BRAND.

Ammonia 2½ per cent.....	2½	× 13	× 20 = \$ 6.50
Available phosphoric acid 8 per cent. 8 × 7 × 20 =	8	× 7	× 20 = 11.20
Potash 3½ per cent.....	3½	× 4½	× 20 = 3.15
			\$20.85

Selling price—\$30.00—Difference..... \$ 9.15

ROYAL CANADIAN BRAND.

Ammonia 4½ per cent.....	4½	× 13	× 20 = \$11.70
Available phosphoric acid 10 per cent. 10 × 7 × 20 =	10	× 7	× 20 = 14.00
Potash 5½ per cent.....	5½	× 4½	× 20 = 4.95
			\$30.65

Selling price—\$38.00—Difference..... \$ 7.35

	Phos. acid soluble and reverted.	Ammonia.	Potash	Sale price.	Real value.	Difference in excess.
<i>Reliance.</i>	%	%	%	A ton.		
Guaranteed.....	6 to 7	2.00	2 to 4			
Found	6.49	2.12	2.92	\$27.00	\$16.11	\$10.89
<i>Victor.</i>						
Guaranteed.....	7 to 9	2 to 3	3 to 4			
Found	7.26	2.32	5.05	30.00	17.76	12.24
<i>Royal Canadian.</i>						
Guaranteed.....	9 to 11	4 to 5	5 to 6			
Found	6.46	6.10	5.61	38.00	30.56	7.44

Thus, it will be seen, the average difference in excess of cost over value, taking three tons of the various brands, is upwards of \$10 a ton. This is more than our farmers can afford to pay. The superphosphates come out better: both M. Choquette and I making the "Capelton" worth 60 or 70 cents more than the selling price, and the other brands not much out of the way. "No. 1" was guaranteed too high, and is to be rectified.

The lesson to be learned from these considerations is: that phosphoric acid can be bought at about its real value at Capelton, but that, as M. Choquette says in his report, "farmers will realise a great profit by themselves making the necessary admixtures of their artificial manures."

And about this mixture-question: we see that the average amount of nitrogen in the three brands is, in round numbers, 3 per cent. Now Lawes found long ago that it took $4\frac{1}{2}$ lbs. of nitrogen to produce a bushel of wheat over and above the natural yield of the land. I suppose every one who uses artificial manure for his wheat-crop aims at an additional yield of 8 bushels an acre. To gain this it is clear we must use at least 36 lb of nitrogen to the acre, and to secure this we must employ 1200 lbs. of a mixture of the three brands we are talking about, the cost of which would be about \$20 an acre!

The price of nitrate of soda of the very finest quality, containing, therefore, 16 $\frac{1}{2}$ per cent. of nitrogen is to-day, according to the manager of the Hamilton Powder Company, who kindly gave me the figures last week, a fraction over two dollars a cwt.—in England it is worth \$35 per 2,000 lbs.—, let us say, \$2.12; to add 36 lbs. of nitrogen in this form to the acre would cost only \$4.70, or thereabouts. To this add 400 lbs. of the "Capelton" superphosphate, at \$12.00, costing \$2.40, and you have for an acre of land a superb manure at the trifling cost of \$7.00! As for the potash, as I have often said before, I do not think much land in this province requires it. At all events it can be added in the form of kainit, or wood ashes, for a mere bagatelle. Our short seasons give potash very little chance to be assimilated, unless it be autumn-sown, and then the spring-thaws are to be considered. If hard-wood ashes are used, 100 lbs. of the superphosphate may be omitted.

Oh! if every parish in the province had one farmer who would sow on his barley, his oats, or his wheat, 100 lbs. of nitrate of soda to the acre, at two sowings, after the seed had braided, the face of the country would soon be changed.

This season, my friend M. Séraphin Guèvremont, of Sorel, will have to try the effect of 400 lbs. of superphosphate and 150 lbs. of nitrate of soda on an acre of land for swedes, without any manure from the yard or village—city, I mean.

400 lbs. superphosphate.....	\$2.40
150 lbs. nitrate of soda.....	3.18
	<hr/>
	\$5.58

He generally uses 40 small loads of dung to the acre at 10 cents; now, these 40 loads have to be carted from the whatever you call it, village, town, city, if you like, at say another ten cents; they must be turned, carted on to the drilled up land, spread, &c. at, at least, 25 cents a load—I doubt if, when the dung is covered in, it has cost less than 50 cents a load, and that is equal to \$20 an acre. Allow $\frac{1}{3}$ of the dung—=\$6.66—to remain over after the roots or potatoes for the use of the subsequent crops, and supposing the whole of the artificials to be absorbed by the fallow-crop, still there will be a large balance left in favour of the hand-dressing.

Or, better still, divide the dressings, half-dung, half artificials: dung \$10.00 artificials, as above, \$2.79, and see the effect on a rotation with the other half-dose of dung given to the grass of the first year after the root- and grain-crops.

Something of the sort you must do, my friends, if you have any desire to retain your present position. Your market for hay, for barley, for potatoes, for pork, &c., has been ravished from you, and I doubt if the newly to be discovered markets will be in any way equal in power of consumption to the old one.

Now, the amalgamated Cotton-companies of Canada say that, owing to their proximity to the States, they can buy the raw-material cheaper than it can be bought in England, and that, therefore, they can sell the manufactured goods cheaper than the English can. If this be so, then owing to our proximity to South-America, we ought to be able to lay down nitrate of soda on the wharf at Montreal at least as cheaply as it is laid down on the wharf at Liverpool, that is at \$35.00 a ton or 1 $\frac{3}{4}$ cents a pound.

Agricultural schools.—Practical farmers in the United States, as well as Professor Sanborn and the earnest-minded Dr. Hoskins, of Vermont, are by no means satisfied with the work of the agricultural schools and stations. They insist upon the necessity of separating the classical colleges from the agricultural and technical schools.

Cheese.—The price of single Gloucester cheese, which had been very low all the summer and autumn, suddenly jumped up last month (December) to from 45s to 50s per 112 lbs.; but, as my brother writes me word, the farmers had previously pretty well cleared themselves out, so the rise in price would not benefit his tenants much. However, at his rent-audit, every one of them paid up in full, and that does not look as if the English dairy-farmer was in such bad condition as our American friends would seem to believe. The single Gloucester is the thin cheese, made from the night's milk skimmed in the morning, and added to the morning's milk. The fact is, the old pastures on the Severn bank are so rich, that it would be extravagant to make whole-milk cheese in the autumn from cows fed on their grass. What did M. Herreboudt mean when he said, at the Dairymen's Convention at Sorel, that "Canadian cheese sent to England was re-exported thence to Belgium as English cheese, and the bad English cheese was also sent there, ticketed 'Canadian-make'?" Surely, if the Belgians wanted cheap cheese, they would find some of the make of their neighbours, the Dutch, cheap enough and bad enough. I do not think our people will make their fortunes by sending their dairy-produce, eggs, &c., to Belgium, unless great care is taken as to the "agent intermédiaire" into whose hands their interests are confided.

Duluth wheat.—Can any one tell me if there is any difference between Duluth wheat and No. 1 Manitoba hard wheat? I ask this, because I see the former is quoted on the London market at about 12½ cents a bushel higher than the best white wheats; e. g.: December 1st; white wheats 34s to 38s per quarter (504 lbs.)—Duluth 41s to 42s. No Canadian wheat in the quotations up to the above date, and I hear there is no No. 1 hard to come.

Barley.—On the first Monday in December, of English malting barleys there were no choice or even fine descriptions offering: holders of such keeping them back in hopes of higher prices in the spring. Of foreign malting barley, there was no Saale to be had, but the next best qualities, Moravian and Hungarian, were worth 44s to 46s a quarter = \$1.38 a bushel of 56 lbs. From what I know of the malt-trade in my younger days, I have no hesitation in saying that a really fine sample of well harvested English Chevalier barley, well sweated in the stack, and well dressed, would not be turned away from any of the great maltings at Saffron-Walden, Ware, Bishop-Stortford, or Royston, even if the grower were to refuse to take less than 50s a quarter for it. The proprietors of these great establishments buy largely on account of the Burton brewers, and pay almost any price for really surperior barleys.

And this brings me to a seriously important subject: the treatment of barley in this country, if we intend to compete with the finer growths of England, Moravia, and the banks of the Saale.

The average price of barley in the Glo'ster market on November 29th was: 680 quarters—£1.6.3=79 cents a bushel.

The judges, at the London Brewers' Exhibition, whose report I have just received, speak in very favourable terms of some of the samples of Chevalier and Golden Melon barley sent from Canada; but, speaking generally, they seem to hint at certain defects, as for instance:

1. Want of vitality;
2. Land not properly prepared or manured for seed;
3. Unequal ripening;
4. Allowed to lie too long on the ground after cutting;
5. Not sweated in stack.

(1) *Want of vitality.*—This of course means that a certain percentage of the grains will not grow at all, and, of the remainder, some, more or less in number, grow feebly.

In order to test this, I got, from one of the principal seedsmen in Montreal, a sample of Chevalier barley, grown from English seed imported last spring, and sent for sale by one of the best farmers on the Island of Montreal. Taking a handful of this, I threw aside all the evidently useless grains, and sowed 50 of the rest in a soup-plate full of moderately fine mould, covering all the grains with an equal thickness of earth—about an inch deep—. The seed-bed I kept fairly moist, and in a pretty constant temperature of from 62° to 65° F., night and day. Of the 50 grains, 28 came up equally on the 6th day after sowing, 6 more threw up the plumule on the 8th day, and the remainder—16 in number—perished from want of vitality. No English maltster would have bought the barley in question, unless he was a maker of "Brown-malt" for porter brewing. They are wonderful judges of the raw material, and can tell at a glance whether a sample will suit their purpose or not.

If this barley were used for seed, unless at least one-third more than usual was sown to the acre, the farmer would be greatly disappointed with the *brard*, as about 32% of it was absolutely useless for that purpose.

(1) *Land not properly prepared.*—Here, I must repeat what I have so often said: you cannot hustle barley into the

ground, give the land a couple of *scarts* of an old blunt-toothed harrow, and produce a first-rate sample of malting quality. To grow this grain in perfection you must have a deep, well pulverised soil. It may follow any crop except grass, but does best after a well manured, well hoed root- or corn-crop. The land should be ploughed a fair depth in the fall—say six inches—carefully water-furrowed, and the seed put in as early in the spring as possible, that is, as soon as the dust flies after the harrows. If you lay your furrows flat in the fall, you will have to plough again in the spring, but ½ of the heavy-land barley in the East Anglian counties—the best malting barley in England—is grown on the stale fall-furrow, and receives no preparation but a grubbing and lots of harrowing.

Now, barley is of all grains the most susceptible of gratitude for kind treatment. You may muddle in your wheat in a roughish tith, but the land for barley should be, nay, must be, as fine as a garden. To produce a good sample, fit for the brewing of the East-India Pale Ale, the grain must come up equally, grow equally, and ripen equally; otherwise, when the maltster begins to deal with it, it will not germinate equally in the couch, and this inequality of growth will continue throughout the process, in the *pieces*, up to the very kiln; the effect being that the majority of the grains will have the *acrosipire* (*plumula*) only half way up the back, when the rest is beginning to show the green shoot protruding from the husk, causing, as is very evident, a certain loss of extract to the brewer who has to deal with it, as well as some other inconveniences, *quæ nunc præscribere longum est*.

To get all the grains in a seeding of barley to come up as nearly as possible equally, it is clear they must all be deposited at the same depth, and the preparation of the land must be such that each grain shall find itself surrounded by soil in the same mechanical condition as its neighbours. How can we secure these two desirable conditions? Only by the use of the grain-drill: therefore, the best way of sowing barley is to drill it in. The land should receive ½ of its working before drilling, in which case the coulters of that machine will have no difficulty in penetrating to an equal depth. A grubbing, two harrowings along and two across the ridges, before the drill, and two tines along them after that implement, should be sufficient, and there being no cross-harrowing after the seed is deposited it will not be pulled out of its first bed.

Where there is no drill to be had, or where the land is too stony for its use, the barley should be put in with the grubber. Here, again, the land should be prepared by grubbing and harrowing before sowing. You will easily see that it is necessary to work the land until it is perfectly homogeneous, that is, until all its parts are equally penetrable by the teeth of the implement. It is not possible, however well we prepare the land, to deposit all the seed with the grubber at an equal depth; but how much less possible would it be were we to sow the seed on the unbroken furrow and then grub it in.

On heavy land, I should proceed thus: pass the grubber across the furrows once; harrow up and down the ridges until the land treads equally under the foot; sow the seed; grub it in along the ridges, and then finish with a stroke or two of the harrows in the same direction. Only, for goodness sake, see that your harrow-tines are long and sharp; don't neglect cross-harrowing *before* sowing, and never leave the piece until the foot can be drawn along across the ridges without finding one place more difficult to penetrate than the other.

(3) *Unequal ripening.*—If the above system of cultivation be followed out, you will have but little to complain of as regards unequal ripening. Of course, on very heavy land, where the ridges are, in my opinion, of necessity very narrow, the stalks on the centre of the ridges will have a tendency to ripen their grain sooner than those on the flanks. For this,

I know of no cure, except thorough-draining, after which these narrow ridges—6 feet only, many of them—might be thrown two or three together. I farmed too long in our heavy lands in England to advise the rashly increasing the width of ridges in really stiff clay soils. Still, I think it would be wise to plough them a little flatter on the crowns, and not to leave such tremendously wide open-furrows between them. However, this is a fault to be met with more markedly in the older French districts than in the more modern Townships country.

The quantity of seed to the acre is a very important consideration. Quality, too, must be regarded. Sow thick: if you don't, the barley, especially if early sown, will tiller, and however desirable it may be for any other grain to behave in that way, it is a most undesirable quality in barley, since tillering necessarily induces in equality in ripening. "If thin-sowing be practised, the plant, soon after its appearance above ground, begins to throw out side-shoots, and as the ears from these are some days longer in coming to maturity, than those from the parent stock, it follows that the latter start to grow from 36 to 48 hours sooner than the former, and when the whole steep is put on the kiln, the sample of malt will be uneven, and the extract from the mash will fail both in quantity and flavour." v. Jenner *Fust on Barley*—Jan. 1888, p. 4.

I should sow from 2½ to 3 bushels an acre of good sound 2-rowed barley; but this would depend upon the earliness of the seed-time and the preparation of the land. In a well prepared loam, with the drill, in April, 2½ should be enough; in rough land, in the latter half of May, broadcast, 3 bushels will not be too much; but I would never sow barley in such land: oats would pay better. Early sown barley *ceteris paribus*, always produces the best quality.

Sow grass-seed after the barley is up, if early sown.

Always roll barley, but after the frost is off the leaf.

(4) *Allowed to lie too long on the ground after cutting.*—As to this point, I think it is not one very likely to occur in this province. As a rule, most of our grain-crops are caught up as soon as possible after they are down. The old rule in England, that barley ought to pass through *three dews* between cutting and carting, may have been a good one, but I confess that, if there is not much grass in the piece, I should be inclined to let the grain stand till dead-ripe and carry it as soon as it was fit. We never tie barley in the East of England, for the straw would not make bands—too brittle—; we supply turn it over once out of the swath, with a long light pole, then roll it together into cocks with a large fork consisting of a pair of teeth below and one tooth above, and get it into stack as soon as possible.

(5) *Not sweated in the stack.*—The maltster's opinion is: unless barley has had at least six weeks good sweating in the stack, it won't work freely out of the couch. By this is meant, it will not put forth its rootlets as fast as it ought to do, and consequently will need the tiresome operation of watering on the floors or pieces, an operation that every working maltster hates. I never made a steep of 2-rowed barley during my ten years experience in Canada; that did not require watering the 8th day out of the couch. The *sweating* mellowes the grain, and increases its power of imbibing water; so much is it desired in England, that if a maltster, from not having reserved a sufficient supply from the previous season is obliged to work with new barley before the 1st November, he will, if he understands his business, and most of them do, give the grain a gentle sweat on the kiln before steeping.

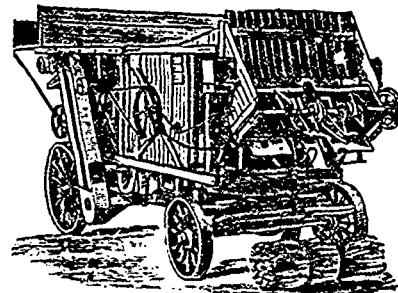
(6) *Threshing.*—Forty years ago, no maltster in the Eastern counties would buy any barley for pale-malt that had been threshed by horse-power: they preferred flail-threshing. The idea was that the beaters of the machine pulled off the bran from the end of the grain and thus allowed the escape

of the acrospire or plumule before it had converted the whole grain into malt. They said the beaters broke off the acrospire, but that was not the case. In 1852, I took the first portable steam-engine and threshing-machine into Essex that had been used there, and I had great trouble in persuading the farmers to use it when I was not employing it myself; but a little experience soon taught the maltsters of Saffron-Walden that a *drum* and *concave* like those made by Clayton and Shuttleworth of Lincoln, or by any of the great agricultural implement makers, do not injure the most delicate grain. I confess that many of our common *moulins à battre* are not calculated to turn out a really first-rate sample of the large-grained 2-rowed barley.

I give an engraving of Howard's threshing-machine. This firm and Clayton's people have had many a severe contest at the R. A. S. of England's exhibitions; as for saying which is the better implement, it would be absurd to try. The feed-mouth is five feet six inches in width, to take our long-strawed wheat in side-ways, and they are fitted with blowers, screens, &c., and with *hummellers* to knock off the beards of the barley. By the bye, the seed-barley I mentioned as having been tested by me had a great many more beards on it than necessary—there were 4 beards in the 50 grains—there ought not to have been one; and, moreover there were 3 grains of wheat and 2 of oats: that won't do for the English market I can assure you. The buyers there are willing to pay good prices, but they want their goods sent to them in perfect condition. For example: my finest white turnips would not sell at all on the Borough (Southwark) market, because the bunches were tied with string instead of withy-twigs; they had to go to the cow-keepers at 15s a load, instead of to the green-grocers at 2s 6d a dozen bunches of 9 = £16 10s a load. It was a lesson I never forgot.

Howard's Royal prize Straw-trusser.

This Machine attached to an ordinary Thrashing Machine will truss and bind as fast as the Straw passes through the drum.



The average cost of Trussing Straw by hand is 2s. a load, and by this Machine 8d. a load. Price of Trussing Machine for 4 ft. 6 in. and 5 ft. drums, £40.

Price of Trussing Machine with transport carriage, for 5 ft. and 5 ft. 6 in. drums, £50—Catalogues Post Free.

J. & F. HOWARD, Bedford.

Lastly, don't forget that soil has more to do with the quality of the barley grown in it than climate.

Mutton.—I have received of late several letters from the States asking for information as to the whereabouts of good short-wooled breeding ewes. I have done what I could to satisfy my correspondents, but with the exception of Mr. Cochrane's Shropshires and Mr. Mark Dawes' Southdowns, I know of no flocks of the kind required.

Sir John Lister Kaze is sending off 1,500 sheep to England from his ranch at Calgary. I should like to see them before they go.

It is evident the farmers in the States have got to grow mutton as well as wool. The fact is, so many of the better class of Americans visit England nowadays that they are beginning to know the difference between the cag-mag carcase of a merino sheep and the plump, well flavoured joints of a down. I suppose the taste for good mutton will some day or other visit us; but I must say that the sheep I see hanging up in the butchers' shops at the West end of Montreal are a disgrace—not to the butcher but to the farmer who fed, or rather did not feed, them.

I spoke some time ago about the scab in sheep, showing how injurious it was to the animal, how contagious, and how easy it was to cure. My ire had been excited by the sight of scabby sheep running at large on the common at Ste-Anne de Sorel. I tried to get the owner of the affected ones fined, but of course I failed. In England, I see by last month's papers, a farmer at Chichester, Sussex, for letting scabby sheep run out of bounds, was fined the trifling sum of FIVE HUNDRED DOLLARS!

PRICES OF LEADING AGRICULTURAL PRODUCTS AT CHICAGO, OCTOBER 16.

Articles.	1889.	1890
Corn..... per bushel...	\$0 30½ to \$0 31	\$0 50 to \$0 50½
Wheat..... do80½ .81½	1.00 1.00½
Oats..... do18½ .19½	.42 43
Barley..... do63	.78
Flaxseed..... do ...	1.27 1.27½	1.45½ 1.46
Buckwheat..... do38 .45	.55 .65
Hogs..... per 100 pounds...	.85 4.20	3 85 4 50
Cattle, choice.... do ...	4.00 5 05	4.75 5.30
Sheep, Western... do ...	3.50 4.20	3.00 4.80

Whether the increase in price to the consumer of the above agricultural products be a benefit or not, I decline to say; but it is clear that this very increase is due to the sadly bad crops raised by the American farmer this last year, and not at all to what Mr. Rusk is pleased to call "the wise economic legislation already secured."

Thinking it may interest some of my readers, I subjoin a list of agricultural imports into the U. S. :

AGRICULTURAL IMPORTS, FISCAL YEAR ENDING JUNE 30, 1890, WITH CHANGE IN TARIFF DUTIES.

	Value.	Old duty.	New duty.
Animals and animal products :			
Cattle	\$ 245,067	20 per cent. ad val.....	{ Over one year, \$10. Under one year, \$2.
Horses	4,840,165	20 per cent. ad val.....	\$30, or 30 per cent, if value over \$150.
Sheep	1,268,209	20 per cent. ad val.....	{ Over one year, \$1.50. Under one year, \$0.75.
Cheese	1,295,506	4c per lb.....	6c. per lb.
Eggs.....	2,074,912	Free	5c. per dozen.
Wools	16,264,083		
Class 1 (above and below 30c. per lb.)		10c. and 12c.	11 cents.
Class 2 (above and below 30c. per lb.)		10c. and 12c.....	12 cents.
Class 3 (above and below 12c. per lb.)		2½c. and 5c	{ At 13c per lb., 32 p. ct. Over 13c., 50 p. c. ad val.
Flax	2,188,021		
Straw		\$5 per ton.....	\$5 per ton.
Not haxkled.....		\$20 per ton.....	1c. per lb.
Dressed lino.....		\$40 per ton.....	3c. per lb.
Tow		\$10 per ton	1½c. per lb.
Barley	5,629,849	10c. per bush.....	30c. per bush.
Hay	1,143,445	\$2 per ton.....	\$4 per ton.
Hops	1,053,616	8c. per lb.....	15c. per lb.
Tobacco.....	17,805,663		
Unstemmed (leaf)		75c. per lb.....	\$2 per lb.
Stemmed (leaf)		\$1 per lb.....	\$2.75 per lb.
All other		35c. per lb.....	{ Stemmed, 50c. per lb. Unstemmed, 35c. per lb.
Potatoes	1,365,898	15c. per bush.....	25c. per bush.
Wines	\$ 959,972		
Champagne :			
Bottles between pint and quart		\$7 per doz.....	\$8 per doz.
Bottles between half pint and pint..		\$3 50 per doz.....	\$4 per doz.
Bottles less than half pint.....		\$1.75 per doz.....	\$2 per doz.

Students.—Ah, it is just the same in England as it is in Canada and the States : the farmers' sons, who intend to follow the real business of farming, sturdily refuse to enter themselves as students at the Agricultural Colleges.

Prices of produce in the U. S.—Mr. Rusk, Secretary of the Agricultural department at Washington "Deems it to be his first duty to congratulate the President and the country at large upon the generally improved outlook in agricultural matters." He appends the following list of prices in '89 and '90 to support him in his argument.

Smithfield Club Show, 1890.—The prize-list of this great exhibition not being yet published in full, I can only mention that my favourite Hampshire-down lambs are again distinguished :

PEN OF 3 LAMBS.

Hampshire-downs 6 cwt. 1 qt. 8 lb. = 708 ÷ 3 = 236 lb. apiece!
 Lincolns..... 5 " 2 " 26 " = 642 ÷ 3 = 214 " "
 Oxfords..... 5 " 0 " 19 " = 560 ÷ 3 = 186½ " "

The Hampshire wethers, under 20 months old, weighed only one pound less than 900 lbs. the pen of three, Baron Rothschild pen of Oxfords being just one pound lighter.

Queen's sale of stock.—The sale of stock at Windsor, in December, went off very well, says the Agricultural Gazette, and good prices were realised. Hampshire-down wethers fetched from \$26 to \$36 each; Hampshire-down lambs from \$15 to \$18; Southdown wethers from \$15 to \$15.25, a gain of 25 cents over the Hampshires at the expense of a twelve-month's feeding!

The catalogue comprised forty Devon, Hereford, and Highland bullocks, 450 Hampshire Down, Cheviot, Highland, and Southdown sheep, and 100 bacon hogs and porkers; and also thirteen Devon and Shorthorn bullocks and heifers, and thirty Berkshire pigs, bred and fed by the Duke of Connaught at Bagshot Park. The bidding throughout was very spirited, and good prices were obtained. Hampshire Down wether sheep realised from £5 5s. to £7 5s. each; Hampshire Down lambs, 60s. to 74s; Southdown wether, 61s. to 75s; Highland wether sheep, 57s. to 65s; half-bred Cheviot ewes, 62s. to 65s. A West Highland bullock, £40; a Devon show steer, £36; Devon bullocks, £29 to £37 10s.; a Shorthorn steer £27 10s.; a Devon heifer, £23 10s.; a Hereford heifer, £27 10s.; Berkshire bacon pigs, £7 10s. to £9; fat Berks hogs, £3 15s. to £6 15s.; porkers, 52s. 6d. to 60s.; fat hogs, Small White breed, £5 10s. to £7 15s.; Tamworth fat hogs, £5 15s. to £8 10s.; ditto porkers, £3 10s. to £5 5s. The amount realised for the Queen's stock was £3,500, and that of the Duke of Connaught £413. The Duke of Connaught's Shorthorn bullocks fetched from £20 10s. to £33 10s.

We have received from Mr. H. STOPES the report of the judges of Canadian barley at the Brewers' Exhibition. They state that it has come out exceedingly well in several particulars, but in respect of vitality, the most important of the points, several samples proved deficient. The indications afforded by these samples showed inequality of growth, improper maturing in the field, or harvesting at an improper stage of growth, improper exposure on the ground, and want of stacking. Nevertheless, the judges say that the barleys, and particularly the Chevalier and Golden Melon, compare favourably with French, Saale, Danish, and other European samples. They conclude that with proper attention, high-class malting barley may be grown in Southern Canada.

Ag. Gazette.

There never will any real good come out of the expenditure of money for industrial education so long as the control and instruction are placed in the hands of men who in their hearts hold manual labor and the arts of industry in contempt. At our present writing we do not know how the praiseworthy efforts to establish an independent industrial college in Vermont will turn out. We hope for the best. But supposing success is attained before the legislature, will there not be a rush of unsuitable men to obtain positions for the sake of the salary, whose whole spirit is antagonistic to, and contemptuous of the work they are willing to take only because they, being second and third rate men, can not get equally high positions in the older colleges? This is a great danger. The work in a large number of our agricultural colleges and experiment stations—if work it can be called—is of a very poor class. There seems to be scarcely any thought put into it, and the outcome is entitled to very little respect from the farmers or anybody else. The waste of money without any valuable results which has taken place at Burlington, and is a subject of ridicule among intelligent farmers all over the state, might and assuredly would be continued in an independent institution in the hands of the same or similar parties, and would surely bring the proposed state colleges into just odium among the classes for which such institutions are nominally designed.

The fact is, that there are not now in the country a quarter as many suitable men for the work as are required to make our industrial colleges and experiment stations worthy of respect. Without public regard and confidence, it is vain to hope for the moral and material support from the people, without which success is impossible.

DR. HOSKINS.

PAPILIONACEOUS LEGUMINOSÆ By W. F. Perkins: a paper read before the Hampshire Literary and Philosophical Society.—In this pamphlet we have presented a *résumé* of pretty well all that is known about the nitrogen question in connection with the nutrition of plants of the bean and pea kind. The first half is devoted to a short description of all the plants cultivated in this country belonging to the natural order *Leguminosæ*, and we notice that the author adopts the idea that Zigzag clover, or Marl grass (*T. medium*) is the true cowgrass, (1) but acknowledges that there is perennial red clover which it is common to call cowgrass. The most important part of the paper is that relating to the new theory on the nitrogenous food of these plants. The subject has already been discussed in the *AGRICULTURAL GAZETTE* and elsewhere, but we may so far repeat, in the words of the pamphlet under discussion, that a leguminous crop contains more nitrogen in its dry substance than any other crop; that nitrogenous manures have scarcely any effect on them; that the soil after a leguminous crop has been grown is richer than before; and yet nitrogen is not assimilated directly from the air. To account for these facts the conclusions of Frank and Hellriegel are shortly stated pointing out that the tubercles on the roots are the seat of a fungus belonging to the class *Ustilaginæ*, and which acts the part of a fixer of the free nitrogen of the air in a form in which it can be absorbed by the tissues of the legume. Our author does not consider the experiments conclusive as yet, and points out that we still want to know whether the nitrogen is accumulated in the plant or in the soil, and whether in water culture the tubercles appear when every care has been taken to free the solution from the germs of this particular tubercle fungus.

EXPORT OF CANADA CHEESE.—The remarkable development in the manufacture of cheese in Canada for the English market, within the last dozen years, is shown in the following figures from D. W. Lewis & Co's market circular, and affords an unpleasant contrast to the course of the export trade at New-York during the same period:

The exports from Canada from May 1 to Oct. 31 have been larger than ever before known, reaching a total for the six months of 1,277,000 boxes, or an average of about 213,000 boxes per month. In 1878 the exports from Canada for the same time were 358,000 boxes, an average of about 60,000 each month. This year the exports from New-York City for the six months ending Oct. 31 were 998,000 boxes, being about 280,000 boxes less than from Montreal. In 1878, for the corresponding six months, the exports from New-York were 1,902,000 boxes or about double what they have been this season, and at that time between five and six times as much as was exported from Canada.

DR. HOSKINS; IN THE VERMONT WATCHMAN.

The *Question box* of the New-York farmers abounds in curious interrogations, or rather in replies to them. For instance:

“What is the best way to kill quack-grass (couch or quitch)?”

Reply: By summer fallowing, or by putting in hogs

(1) Where'n he is wrong. The *Trifolium medium* is a very coarse clover, with creeping roots like couch-grass.

A. R. J. F.

enough to root it out. This can be done by fencing off the patch and scattering corn over it to induce the hogs to root."

Well, I should have thought that advanced farmers like Col. Curtis and the Secretary, Mr. Woodward, might have heard of such a process as "the autumn cleaning of stubbles," which, combined with the growth of hoed crops, roots or corn, soon clears a farm of couch-grass.

Very different is the answer to the question: Do not cows need exercise daily? I like that phrase of Col. Curtis: "blind stupidity" is good.

Geo. A. Smith—Yes; but they should have it in a comfortable place. If hitched with a fastening round the neck they can take it, moving backwards and forwards. If a man thinks his cows must go out of doors, he should drive them out and keep them moving and put them right back. This all-day business is wrong.

Col. Curtis—In this enlightened age the all-day exposure of cattle to our bleak winters smacks more of determined and blind stupidity and barbarism than of common sense or humanity.

Canadian horses.—The writer of the annexed quotation from the Field, is of course speaking of the men and horses to be found at a meet of the Montreal Foxhounds. The great fault of Canadian horses in general is that they have not "nice sloping shoulders and good withers"; in other words as, practically speaking, no one rides in Canada, horses are bred entirely for harness, and their shoulders are upright, they are low in the withers, and their action, in consequence is rough. If our Township farmers would only ride, instead of driving along their lovely country in those horrid buggies, they would soon learn how to breed hacks and hunters that would fetch remunerative prices in the foreign markets. Most of them have good hands, being always used to the plain snaffle-bit, and a hunter that can carry his head well in a single snaffle, and possesses withal a fair amount of breeding and "gentlemanlike" manners, is always worth, in England, pretty much what his owner likes to ask for him.

There is a very interesting account of the Montreal Hunt (1) in last week's Field, in which "M. F. H." says: "During a recent visit to Canada I was very pleased to find that the fox is hunted there with quite as much keenness as in the Old Country, and that the Canadian is just as fond of a gallop over his stiff timber-fenced country as any of our thrusters in the shires." This gentleman, who is a good judge of horse-flesh, in writing of the nags at the Kennels, says: "Canadian horses are very fair weight-carrying hunters, have nice sloping shoulders, good withers, and show plenty of quality. They are fine natural jumpers, especially over timber, and are, as a rule freer from hereditary unsoundness than the English horses."

The farmers of Canada are very blind to their own interests that they do not go extensively into breeding the proper stamp of weight-carrying hunter for the English market. The demand is always there, and from \$500 to \$1000 is about the average price for a fairly good horse to carry fourteen stone or more with hounds.

M. Maguire's letter is severe but true:

HORSE BREEDING IN CANADA.

To the Editor of the "Star."

SIR.—In an Ottawa paper there recently appeared an article with the above heading, in which this statement occurs: "It is satisfactory to notice that the attempts to improve the breed

(1) M. F. H.—Master of Foxhounds.

of horses in Canada are attracting attention abroad." This is only partly true, as our horses do not attract much attention in Europe. Buyers over there want either a carriage or an army horse. The trotting horse, as known here, may be classed with the scrubs, a surplus stock, and the only market open to Canada for such animals was the American, now virtually closed by the McKinley Bill. The same paper speaks of the success attending the breeding of thoroughbred stock. If by thoroughbred it means English thoroughbred, then only a very small amount is attempted. The Government has had its attention called several times to this very point. If on the other hand, the word "thoroughbred" is used in the sense of "standard-bred," then there is a very wide distinction in the meaning of the two words. The modern trotting horse is a mixture of breeds, and any horse can become a "standard-bred" by attaining the speed required by the National Trotting Association rules. A "scrub" if it could attain the speed would become a standard-bred. Unfortunately, the majority of our home-bred horses, outside of the draughts, are scrubs, because they are

FIT FOR NEITHER CARRIAGE NOR SADDLE.

If the Government would accede to the numerous signed petition that was presented to Hon. John Carling, Minister of Agriculture, many of the signers being members of Parliament and breeders as well, Canadian horses would be improved by the importation of thoroughbred sires, to be placed on the experimental farms, and also given to those counties who would apply for them, at such a price as to be within the reach of owners and breeders. I defy contradiction when I say that the class of horse in demand for export can be secured only by such use of the English thoroughbred. If breeders do not know that every time they breed from a grade they retrograde, it is time they learned the fact. We are told there are not sufficient well-bred mares to cross with English thoroughbred sires to produce the carriage and army horses that are required for export. I say let the Government import the stallions and we will raise the mares. By reference to the report of the banquet given to the British Agricultural delegates at the Russell House, Ottawa, on the 10th ult., it will be seen that, while complimenting the country generally, some of them referred to the inferiority of Canadian live stock, especially horses, thus supporting my contention on this point.

Ottawa.

W. C. MAGUIRE.

Wool.—My wife tells me that wool for knitting stockings costs, by the pound, one dollar sixty cents. I should like to know why there is such an immense difference between the price the farmer gets—30 cents—and the retailer's price: five hundred per cent is rather more than usurious profit; of course, as usual, the poor are the sufferers.

FEDERAL EXPERIMENTAL FARM.

(Continued).

These laboratories are called *experimental farms*. It is only of late years that the different governments have taken these institutions under their immediate care; but we learn that in our old mother-country, the good king Louis XVI., as long ago as 1783, established at Rambouillet, a few leagues from Versailles, an experimental farm, whither he was wont to repair for the purpose of escaping from the cares of royalty. To the practical experiments at this farm, France is indebted for the origin of a race of sheep which is still in high repute there. We know that, about the same date, Parmentier,

under the patronage of that powerful, but, subsequently, unfortunate monarch, carried out experiments on the potato, which, by destroying the prejudice which up to that time had rigorously excluded it from the list of French comestibles, won for it an introduction to the general table.

To-day, experimental farms are kept up by all European governments as well as in the different states of the neighbouring republic. A French agriculturist, M. P. Joigneaux, writes: *Their utility is indisputable. Farmers can no more dispense with their aid than the services of a physician, in cases of sickness, or of a lawyer, in cases of law, can be dispensed with.*

During the parliamentary session of 1884, a special committee was appointed to enquire into the best means of encouraging the development of the agricultural industries of Canada. After consulting with the principal agriculturists

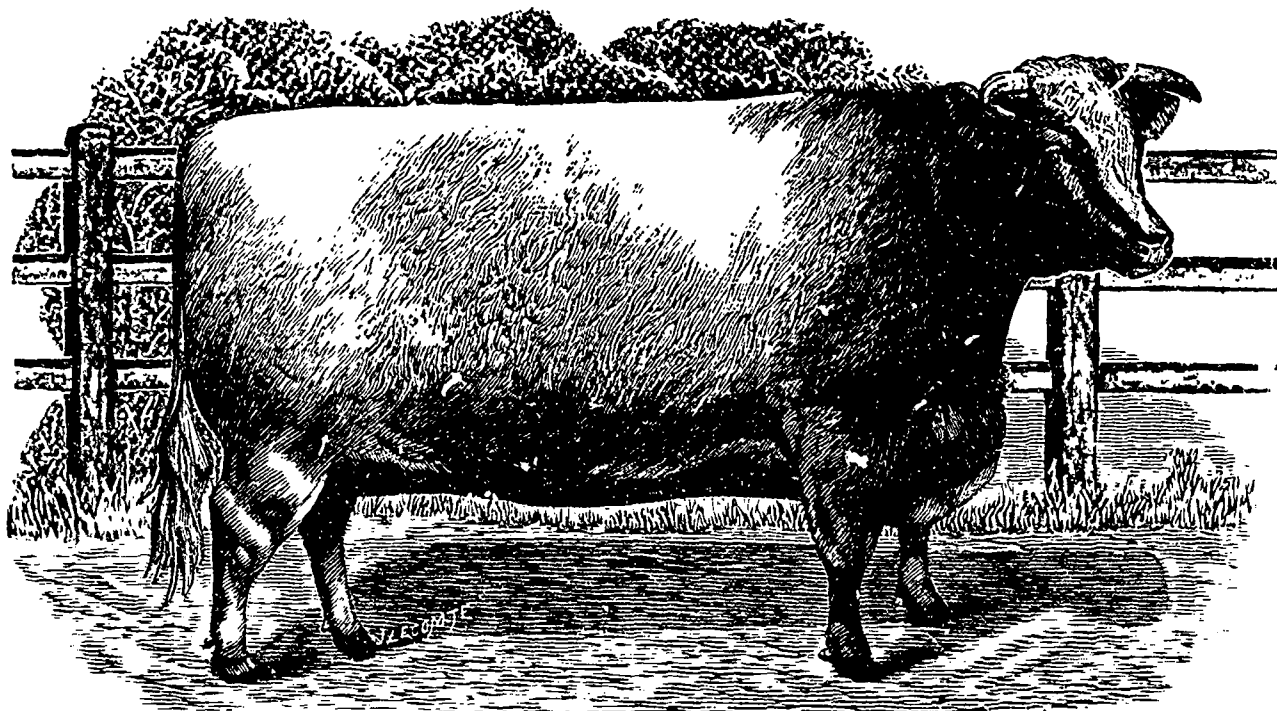
the different conditions, climatic and otherwise which obtain in the several provinces and in the N. W. territories.

(b) To study the economical questions that belong to the production of butter and cheese:

(c) To prove the merits, the hardiness and the adaptability of new or hitherto untried varieties of wheat and other cereals, of field-crops, grasses and fodder plants, of fruits, vegetables, plants and trees, and to distribute among people engaged in farming, in horticulture, or in fruit growing, under conditions to be prescribed by the minister, samples of the products which shall be considered specially worthy of introduction;

(d) To analyse natural and artificial manures, and to experiment on their effect, in order to show their comparative value when applied to different crops;

(e) To study the composition and digestibility of the foods given to domestic animals;



SHORTHORN HEIFER, PRINCESS JOSEPHINE 2ND.—Winner of the Elkington Challenge Plate at Birmingham Fat Stock and of the Champion-plate at Smithfield Club Show. The property of Her Majesty the Queen.

of the country, and even with some foreigners, this committee presented an elaborate report—March 21st, 1884.—in favour of the establishment of experimental farms in the different provinces of the Dominion. This report, signed by Mr G. A. Gigault, M. P. for Rouville, met with the general approval of both political parties. (1)

In the session of 1886, two years later, parliament passed, unanimously, a special law providing for the creation of these farms, and defining their plan of operation.

II

The object of the Experimental farms cannot be better explained than by reproducing the words of the Act establishing them:

(a) To make investigations and to verify experiments for the purpose of discovering the relative value, in every respect, of the different breeds of cattle, &c., and of their adaptability to

(f) To make experiments in the planting of trees, whether intended for building purposes or for shade;

(g) To investigate the diseases to which plants and cultivated trees are subject; the ravages committed by destructive insects, and to make experiments to prove what are the most efficacious means of preventing and remedying these injuries in each case.

(h) To enquire into the diseases of domestic animals.

(i) To test the vitality and purity of agricultural seeds; and

(j) To make all further experiments and investigations connected with Canadian agriculture which shall be approved by the minister.

As we saw above, the plan was intended to embrace all parts of the Confederation. This provision of the law has been observed; in the province of Nova Scotia, a farm has been founded, at Nappan, for the Maritime Provinces; another at Brandon, Man.; another at Indian Head, N. W. T., and one at Agassiz, B. C.; but the principal station is the

(1) *Agriculteur*—a farmer; *agronome*—a scientific farmer. Traus.

Central Farm at Ottawa. This last is our chief concern, as it is intended to exert its influence over the farmers of the Province of Quebec.

The extent of the important central station is 466 acres. It is situated on the outskirts of the city of Ottawa, and occupies a gentle declivity, whence one has a splendid view, not only of the Federal capital, but also of the picturesque country in its neighbourhood both in the province of Ontario and in that of Quebec. The soil presents that diversity necessary to the practical working of experimental agriculture. All sorts of soil are present, from heavy clay down to light loam. (1)

The short space of time that has elapsed since its foundation has not allowed this establishment to attain to what may be called the pitch of perfection. Part of the land had to be cleared; buildings had to be erected; implements, both common and special, had to be provided, and the plans of operation to be laid down and combined. Still, the visitor will be agreeably surprised at the high degree of organisation and the perfect state of working which have been secured in so short a time. The fact is, that the Minister of Agriculture has been very fortunate in his selection of the persons entrusted with the management of the farm. They are men thoroughly competent in their several departments, and have been chosen for their merit alone. It may be said in this case with truth, that *the situation has sought the man, and not the man the place.*

Thoroughly equipped in every point, the central farm has now seriously and practically entered upon all the phases of experimentation.

A great variety of trees, of shrubs, and of fodder and leguminous plants, many varieties of grain, the improvement and introduction of which are considered useful to Canada, have been already cultivated there in a careful and judicious manner; and compared with each other.

The chemical laboratory is in full work, and is doing good service to the farmers. At their request are analysed products, artificial manures, and all matters a knowledge of the chemical composition of which may aid and interest the agricultural public.

A short time ago, a French colonist of the Eastern Townships, who is in the habit of examining with care and intelligence the soil of his farm, was anxious to know what percentage of carbonate of lime it contained. He sent a sample of the soil to the experimental farm, by post, and, a short time

And blowing sand.

A. R. J. F.

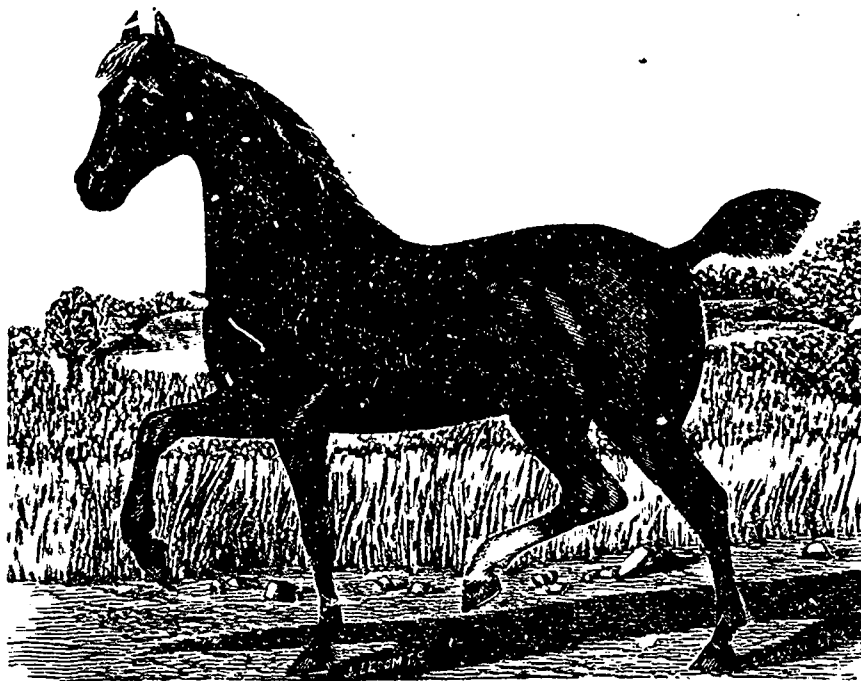
afterwards, received, by the same route, an elaborate report which gave him ample satisfaction.

Last winter, many farmers had recourse to the farm for the purpose of testing the germinating value of the seed offered for sale by the Montreal and other dealers, and this facility offered to all of controlling, free of cost, the quality of their seed, has already had the effect of putting many seedsmen on their guard, and will hinder the perpetration of many abuses.

Special attention is given to the cultivation of fruit trees. Varieties from Russia and other cold climates have been and continue to be imported. As soon as the value of any species is sufficiently proved, and when no doubt remains of its acclimatisation in our country, its general adoption here will be recommended; and more, a gratuitous distribution will be made of cuttings and grafts for the purposes of propagation.

III.

Here is [one] praiseworthy side of the experiments as conducted by a government; the experiments being conducted solely for the sake of instruction and to show the utility of any novelty, it has no interest in boasting about them, or in taking credit for them. Having neither the idea, nor the wish to make a speculation out of them a source of profit, it is not tempted, as a private individual would be, to brag out of all reason, and often prematurely, about the success of its enterprise.



IMPORTED FRENCH COACH STALLION INDRE.

What mistakes, will our honest and sometimes too confiding *habitans* avoid! Four or five years ago, a man from the neighbourhood of Boston, drew thousands of dollars from the pockets of our farmers by selling them young apple-trees, the fruit of which was to surpass anything that had then ever been seen in this country. His promises and demonstrations led to the planting of several orchards, the leaves of which, during the first two years, gave hopes of success; but the rigours of our winters played havoc with these exotics. The nurseryman might have been acting in good faith, but he was not the less a cause of injury and discouragement to those who, like himself, were not aware that our climate resembles that of Siberia rather than the climate of Massachusetts.

A few years ago, a travelling agent went through the country with vine-plants which were to do marvels. Each farmer could plant a vine-yard without trouble, the richest grapes were to be gathered in abundance, and the cellars were to be full of generous wine. Unfortunately, this rival of the Boston

nurseryman succeeded in selling an immense number of his plants, and, like the other, he made as many victims as he had customers. The intrinsic qualities of his vines may have been excellent, but, not being adapted to our climate, they perished miserably at the first attack of the frost.

And, still, the vine and capital wine is made in climates as severe as ours. The truth is, the wild-vine flourishes everywhere in our virgin forest. The illustrious Jacques Cartier could not conceal his admiration at the sight of the grapes growing on the Isle of Orleans, which he, on that account, named the Isle of Bacchus.

At the experimental farm, special attention is given to vine-growing. At present, 150 varieties of grapes are cultivated experimentally, and it is proposed to add a great number of other sorts. As soon as the practical value of any sort is settled, whether as regards the fabrication of wine, or as a simple dessert fruit, it will be distributed gratuitously among the farmers.

Especially are efforts being made to improve the cultivation of cereal crops. Since our summer is so short, it is of the greatest importance that only the most precocious sorts should be grown.

The farm-director, making use of the consular agents of the British empire, procured grain grown in climates analogous or even severer than our own. Thus, in 1887, a variety of wheat grown near Lake Ladoga, in the north of Russia, was imported. The latitude of that place is 840 miles north of Ottawa, and 600 miles north of Winnipeg. For three seasons, this Ladoga wheat has been grown at the central farm and its branches, as well as by a crowd of private persons, to whom samples have been sent for the purpose of experiments, which, up to to-day, prove that the Ladoga ripens, on an average, ten days earlier than our most precocious wheats, such as Red Pife, White Russian, &c. This is one of the most important operations. If, as everything goes to prove, this wheat be definitively introduced into our system of cultivation, it will render us such service that it alone will suffice to pay for the whole expenditure incurred up to the present time by our experimental farms. A Scotch farmer, of Manitoba, told me lately that a ten days earlier ripening wheat would have the effect of doubling the certainty of the harvest of that province, and would, besides, render possible and profitable the breaking up of millions upon millions of acres in the more northern part of our territories.

The official statistics of the ministry of agriculture show that the brewers of Great-Britain import annually from abroad 40,000,000 bushels of barley, in addition to what they buy in their own country. Now, out of this immense quantity of barley bought abroad, do you know how much Canada supplies? The confession is almost heart-breaking when one thinks of the extent and fertility of our land: we only sent out, last year, the trifling quantity of 1,600 bushels. (1) Hardly two car-loads!

Considering the facilities of production we enjoy and our closely linked commercial connections with the mother-country, this fact is almost phenomenal! Still, it is easily explained, when we consider that we do not cultivate the varieties of barley which the English brewers prefer. Brewing is carried to perfection in England. Visit any part of the known world and you will find that English ales are valued and consumed there. To the care taken in their manufacture is their reputation due. Now the selection of the barley is a part of this care, and it plays a great part in the quality of the malt. English breweries use exclusively 2-rowed barley.

The farm manager sent at once for samples of 2-rowed barley, selected from the sorts most in favour among maltsters,

in order to introduce its cultivation into the country. (1) These selections have answered perfectly, and from all appearances in a very short time our Canadian farmers will be able to supply a part of the above mentioned immense market which to-day is, so to speak, closed to them. A variety of *beardless* 2-rowed barley, from Reading, England, has been grown, this summer, at the central farm, and succeeded well, yielding 50 bushels an acre. Another kind, sent by the Royal Agricultural Society of Denmark, which country exports a great deal of barley to England, has been sown at the Indian Head farm. Less in yield than the preceding sort, it excels it in weight and quality.

In order to thoroughly understand the bearing of this proceeding, we must bear in mind that the average price of our ordinary export barley has been, for the last ten years, 71 cts the bushel; while the average price of *malting* barley in England, during the same period was \$1.30. Allowing the extreme cost of the Atlantic voyage to be 12 cts. a bushel, a balance remains of 47 cts. a bushel as an encouragement to us to open as soon as possible this new road to our agricultural prosperity.

We remarked that one of the objects assigned by Parliament to the experimental farms was the investigation of *questions belonging to the production of butter and cheese*. This part of the programme has not been neglected at the central farm at Ottawa. A fairly numerous herd already exists there, including representatives of the principal breeds of cattle, and experiments are being made on their respective properties as regards the production of milk and of butcher's meat. The value of plants relatively to the quantity and quality of milk is also the object of careful and methodical enquiry. This summer, a silo has been built, and 70 varieties of ensilage-corn have been grown, with a view to the discovery of the sort that yields the best crop, and is at the same time the best suited to the production of milk.

Again, for the advancement of the dairy-industry, numbers of trials are being made with different grasses, native as well as foreign, for the sake of improving our artificial meadows and encouraging the laying down of permanent pastures. An experiment has been begun in growing crops for *green-fodder* for cows in summer. It is intended that great attention shall be devoted in this division of the operations of the establishment.

IV.

I shall not insist on the services which the experimental farms are so clearly in a position to render us. Their usefulness, admitted as it is by all agronomes of to-day, cannot be doubted by the enlightened part of our farming population.

Still, one may doubt if our compatriots in general have taken a sufficiently earnest interest in the organisation and the aim of an institution founded expressly for the advantage of their province. When we study the list of persons who have visited the central farm at Ottawa, who have been in communication with the staff, or who have tried to take their part in the experiments carried on there, I confess with regret that the names of farmers of the province of Quebec do not appear very frequently in it.

Our educated men, our men of influence, might do immense good by employing themselves, each in his own sphere, in awakening the attention of their fellow-citizens, and in exciting them to rival the zeal of the inhabitants of the other province in the study and observation of the work at the central farm.

Let us make no mistake: the agricultural question seeks

(1) The Dow's brewery of Montreal uses nothing else, as long as it can be had; the Dawes' people of Lachine won't buy it, agree with the former.

(1) To England, that is

For, now, perhaps, more than ever, the assistance of calculation and study. The trades of our towns, while insuring us a market, carry on a terrible war against us by attracting our rural population, and inducing them to resort to the towns by the offer of high wages. The only way to stop this movement, which seems to be assuming dangerous proportions, is to lead our farmers to the employment of new methods, more paying systems, in order to re-establish the equilibrium between the wages of the farm and the wages of the factory.

It is all very fine preaching about the nobility of agriculture; to talk about the Romans entrusting the guidance of the State to a simple ploughman; to quote the poets who have sung the blessings of the life of the farmer; all this will go but a little way towards restoring the courage of the husbandman, towards renewing the severed bonds which attached him to his business. Instead of warbling sentimental songs in his ear, let us show him by the results of judicious and unbiassed experiments how he may double the yield of his crops, how he may increase his revenues. When his sons come to see that the gains of the farm are as good as the wages of the work shop, they will remain attached to the family farm and will desire no other road to prosperity.

Instead of trying to persuade the routine-farmer that he is another Cincinnatus, let us try to lead him to have recourse to the teachings of experience, to accept those improvements which the necessity of the times render obligatory.

If the manufacturer can afford a liberal remuneration to the workman, it is because he has known how to perfect and to keep on daily perfecting all means of production. He has had recourse to the inventions of science to replace the muscular force of man by the forces kept in reserve by nature. Not satisfied with turning aside the course of rivers to convert them into motive-powers capable of multiplying the power of the arms of man, he plunges into the very bowels of the earth in search of fuel to produce steam, that marvellous cause of our economical revolutions.

Following the example of the manufacturer, the farmer must perfect his means of production. He must use the resources of intelligence to increase the power of manual labour. He must learn how to get his share of the elements held in reserve for him since the creation. Like the manufacturer, the farmer must no longer be satisfied with the common style of work, but avail himself of the mineral manures which our mountains conceal in their sides in such immense quantities and so easy of access. Our quarries of limestone and apatite form a powerful aid to our agricultural progress. It is a certain fact that these manual matters are, of themselves, a means of working such a revolution in farming, as steam has caused in manufacturing operations. And the consideration of this prospect has by no means escaped the observation of the director of the experimental farm. Hardly one experiment in cropping has been undertaken without the employment of chemical manures having some effect on the results. There is no better way of making them popular than this.

The chemical composition of plaster was long known before it was used as manure. Learned men know that, theoretically, it entered into the formation of plants; but it took an accidental experiment to bring into notice its fertilizing powers. It is related that a German workingman, employed in a gypsum quarry, had to traverse, in going and returning from his work, a narrow path across a meadow. The herbage close to the path was observed to flourish more than the rest of the meadow, and the beneficent action of the gypsum shaken from the clothes of the workman as he passed having been judged to be the cause, plaster quickly became the favourite manure of the farmers of the neighbourhood. All the world knows how Franklin, by aid of an argument drawn from an experi-

ment, succeeded in making plaster appreciated by his fellow-countrymen.

But people will say, how are we to study and follow out the operations of experimental stations so far from our homes and embracing so many and such varied experiments?

First of all, you must know that each undertaking, each crop, each proceeding, so to speak, is carefully inscribed and marked in separate registers. The facts and observations are so classified and arranged that by writing to the manager, it is very easy to obtain any required information. As to the general methods of the establishment, that can be satisfactorily followed by means of the Bulletin, which is published periodically, both in French and in English, and sent gratuitously to all who ask for it.

Letters and samples, &c., may be sent post-free, to: The Director of the Experimental Farm, Ottawa.

I stated, just now, that the farm had not yet arrived at the pitch of perfection. It is very sure that its usefulness will largely increase with time; but, even in its relatively embryonic state, the intelligent farmer will find after his visit that he has profited by what he has seen, and has gained valuable knowledge and ideas from its inspection. A gardener from Western Ontario writes that three hours spent at the farm paid, in knowledge gained, for all the cost of his journey thither. Why should not a farmer from this province be equally benefited by visiting this establishment? If the sight alone of the farm-station pays his expenses, he will have the opportunity in addition of a gratuitous sight of the architectural as well as the natural beauties which adorn the Federal capital and its neighbourhood.

Our various societies, the agricultural associations and clubs, might easily assist in this by offering to their members the means of keeping themselves well informed as to the work of the institution, a very weak and imperfect description of which I have just laid before you.

M. l'abbé Montminy said, last year, at the meeting of the Dairymen's Association:

Agricultural clubs are powerful promoters of the establishment of butter and cheese-factories, and, consequently, valuable assistants to our Dairymen's Association.

This testimony, coming from a man who has himself attained to wonderful success by and through the means of an agricultural club, should urge each of us to do something towards increasing the number of such associations in the district he inhabits.

For my part, I should like to see every place have its club, the officers of which should be in communication with the experimental farm. At the regular meeting, the "Bulletin" might be read, discussed, and argued about.

More than that; I could wish that the club might agree with the railroad companies to give the members, desirous of visiting Ottawa, tickets at a reduced rate. Very moderate fares are charged to excursion parties going to a Lacrosse match, to races, circuses, and other amusements; why should not the same advantages be offered to our agricultural classes who travel for the purpose of instruction and of advancing themselves in their business. Are not railroads deeply interested in the material progress of the country? Does not everything that tends to augment the amount of the national production, at the same time tend to augment their receipts.

In conclusion: Farmers of the province of Quebec, it is in your interest that the Government has undertaken this experimental work; it is from the public funds that it has been organised, directed, and maintained. This money has been voted by your representatives in Parliament with the praiseworthy view of promoting the progress of agriculture; but, in order that these sacrifices may be useful to you, your intelligence and good-will must support these establishments.

As far as you are concerned, the success of the experimental farm is in your hands.

CORRESPONDANCE.

THE AERATION OF MILK. RECTIFICATION.

To the Director of the *Journals of Agriculture*.

Sir,—Not having yet the honour of being reckoned among your numerous subscribers, I am indebted to Mr. Bourque of this place for a sight of an article, on the aëration of milk, that appeared in your number of December last.

I see with pleasure that Mr. MacCarthy has not forgotten his promises, but I must confess to your readers that his mode of arguing the question raised at the Sorel meeting hardly seems to me to settle it.

A short essay, on the same subject, which I wrote at the beginning of December, 1890, will appear in the 9th report of the Dairymen's Association: the manuscript is now in the hands of the secretary, M. J. de L. Taché.

This essay, it seems to me, is a full answer to Mr. MacCarthy's article, but I do not intend to ask you to reproduce my statements (*appréciations*), for fear of wearying your readers, while you can interest them by other more useful communications.

Still, I must be permitted to say that I have read, with more attention than Mr. MacCarthy is willing to believe, the work of Mr. Lynch, and he may satisfy himself on this point, if he will condescend to read my essay on aëration.

As to the opinion of Professor Robertson, I confess myself unable to discuss it, as I have not the original at hand; besides, at present, I am rather distrustful of quotations. Still, I will say that I do not thoroughly understand the 2nd and the 3rd. For, indeed, if decomposition has taken place, there must be acidity and I believe, with Mr. McPherson, that a certain amount of acidity favours the action of the rennet.

As regards the aëration of the milk, in the case of cheese-making after the Cheddar plan, I refer your readers to the passage in my essay in which I compare the action of the air to the sowing of useful germs, such as takes place in the mottled cheeses (*like Stilton &c.*? Trans).

There remains, lastly, the authority of Dr. Fleischmann, but as his incomparable treatise was written before the publication of the important researches of M. Duclaux on milk, I doubt very much if that learned German would now-a-days pronounce such an opinion as the one Mr. MacCarthy pleads against me.

On my side, I could quote numerous specialists who share my ideas on the aëration of milk, but I am unwilling to use lessly prolong this reply. I content myself with assuring the readers of your Journal that the laboratories in which I imbibed my theories are not so commonplace as my opponent seems to wish to make them believe.

His countrymen, Pasteur, Duclaux, Paurian, &c. would appear to wield as much authority in the matter as Messrs. Lynch and Robertson, whose great competence, all the same, I am happy to recognise.

One word in conclusion: a parenthesis, certainly not dictated by very Christian sentiments, might cast some doubt on my qualification as a Belgian Civil Engineer. I hold at the disposition of the author of the allusion my diplomas and certificates, or, if he prefer it, he can apply to the Royal Agricultural Institute of Gembloux, Belgium, which I entered Oct. 6th, 1870, and quitted August, 1873. For more ample information, application can be made to the Minister of Agriculture of Belgium.

I am satisfied with being the son of a simple farmer, and all I look forward to is to become a good Canadian *habitant*.

I trust, Sir, that my name having been pretty frequently mentioned in your Journal, you will open its columns to this reply in your next number. For guidance, I leave in the hands of one of your confrères a copy of the present letter to be made use of if occasion should arise. Yours, &c.

M. DELLICOUR.

Sherbrooke; Jan. 30th, 1890.

OUR ENGRAVINGS.

Canadian phosphate mine.—This cut shows the process of extracting the apatite from its matrix in the rock. I regret to hear from my son-in-law, who is a large proprietor of phosphate lands, that his agent in England writes him word that the inquiry after such property is not nearly so avid as it was.

Imported French Coach-stallion.—A gayish goer, apparently, is this animal. Full information on this breed will be found in a review of M. Couture's article on it at p. 49, Oct. No. 1890.

Shorthorn Heifer.—This lovely beast, the property of the Queen, won the Elkington Challenge prize at Birmingham, and the Champion plate on the Smithfield Club-show, in 1890, proving herself to be the best animal of her year in the cattle-classes. I cannot see a fault in her. Unfortunately, she was carried about too much in the months of November and December for her health, and the London fog proving too much for her, she died the last night of her triumphant career at Islington.

Sherbrooke, February 4th 1891.

A. R. JENNER BUST ESQ.

Dear Sir,—I have been searching through the back volumes of the Journal of Agriculture for an article written by you some years ago upon the subject of finishing off store pigs so as to make the meat firm but not tough, and I have not been able to find it. You mentioned pease as being used, but whether with advantage or not I do not remember, and certainly there must be a diet which, other things being equal, would bring the matter out of the realms of mere chance. In making hams and bacon I find that, as a rule, the country cured bacon is left in brine too long, and generally both the bacon and hams are smoked to an extent of "tanning" the lean parts almost to an extent of making good leather of them: two days in smoke seems to be ample, if it is fairly well kept up. I remain, Yours very truly.

W. A. HALE.

Dear Sir,—You will find a couple of short phrases on pig-feeding at page 36, March No., 1888, and p. 7, Feb. No., 1889. But the system is simple enough: skim milk and barley—or corn-meal up to within 3 weeks of slaughtering, and whole pease for the remainder of the time. My own treatment of pigs from the-birth, when I was in the habit of fattening from 100 to 120 a year was:

Wash from the house—our family, including servants, was in number about 40—, mixed with pollard, for the sows and growing pigs, with clover and tares mown green. The young ones were weaned at 8 weeks old.

Pigs are almost invariably weaned too soon in this country. (1)

(1) Pease do not harden flesh as do horse-beans, lentils and other pulse, but merely firm the flesh: "When pigs are fattened on the highly nitrogenised leguminous seeds—pease being if not an exception, at least very much less objectionable than some others—the lean is said to be very hard." *Laws on Pig-feeding*.

Very truly yours,

ARTHUR R. JENNER BUST.

THE NEW ONION CULTURE (1)—We have to thank M. Greigner for a copy of his very ably written, well illustrated and attractive little book on onion culture. This volume, although most concise, is really of great value to the grower of onions. It is a true gem, not to be valued by its small size. We read it from end to end with pleasure and profit. Young farmers especially, who wish to make money by perfect cultivation of garden crops—not only onions—will find in the *New Onion Culture* such principles as are sure to secure success in general cultivation, viz : Perfect drainage.—ample, intelligent manuring ; —thorough cultivation, which makes plants grow and kill all weeds ; proper seeds, sown in the right time, in suitable soil, suited both to the climate and the market ; finally, careful harvesting, and marketing in such a way as will secure the highest net returns.

May this excellent little book be enjoyed by many thousand of interested readers, and may it prove as profitable to others as it has been to us.

ED A. BARNARD.



CANADIAN PHOSPHATE MINE.

London, 24th January 1891.

THE EDITOR OF THE *Illustrated Journal of Agriculture*,
Montreal, Canada.

BARLEY.—Several of the correspondents we have in Canada have asked us questions relative to barley and some evidently suppose it is to give details as to possible value of your home grown. This is quite impossible without samples are forwarded.

Then it will be a pleasure to us to give a valuation.

The crop of barley harvested the past year in England was but a moderate one from the users points of view and really A. 1. Malting English barley is scarceish

To day's price for best English malting.....	36j—	44j—
Ordinary.....	24l—	30j—
Feeding.....	19j—	22j—
Foreign barley per 400 lbs.....	18j—	20j—
Saale and California per 448.....	40j—	50j—

Some kinds being slightly cheaper and some slightly dearer than in January 1890.

We think that it is likely if the regular Canadian barley such as has gone heretofore into the U. S. market for malting purposes were carefully put before our maltsters and Light Ale Brewers, a demand for it might be made. And we shall be pleased upon receipts of sample of fine and good ordinary to report as to the general opinion of English buyers.


POULTRY.—We note with interest parcels of Canadian Turkeys have been coming along, but respectfully caution Ca-

nadian correspondents against supposing the business is one bound to pay. It may, and will, if the birds are prepared and sent to England as they are when shipped there from France and Northern Europe. It is customary in these countries to always pluck the birds—always—Next, to pack hens separately—cocks separately. The best size hens run from 8 to 10 lbs. each. Cocks 10 to 12 lbs. They are always packed in cases and the gross, tare and net weights are marked upon each case distinctly. Each shipper marks his consignment so that it can be easily identified. Thus, one will mark another A and so on. This facilitates hand ling of the packages and lessens cost when weights of cases run even or nearly so. Buyers also can inspect by opening a single case and a deal is made based upon the average. Of course, if any case opens unsatisfactorily—sellers being careful on this point—others will be examined. But as it will occur to any one from our remarks as to selection—birds packed of near weight : hens alone ; cocks alone ; sell better always, and further, please carefully note : Only one year birds should ever be shipped here. Two year old and up will only sell at a great loss. Another important point is to avoid shipping unplucked birds. We do not say they will not sell, only, they will not sell so well. The dealer will not and as a rule cannot afford the labor of preparing such for the consumer, and we seriously doubt if these unplucked birds will travel safely.

No one should ship except by refrigerator cars and by steamer which can keep the stock in refrigerators across the ocean. And, it should be borne in mind thro' freights rates can be secured to London via Liverpool, and London is often a better market than Liverpool is. It might not however be a bad plan to have the option inserted in Bills of Lading.—

Liverpool and or London, at the option of consignee. The turkeys should be packed in straw, clean, dry and fresh-straight straw. Large birds will sell, but medium size command relatively better prices and are certain to find the readiest demand. But let sellers be sure and recollect : buyers are accustomed to purchase cases and not barrels, and the cases will sell easiest—thro' brls will sell—as buyers are accustomed to that package.

Eggs.—Some largish parcels of Canadian eggs have gone to Liverpool, but London is far and away a more promising market than that town, and we have much pleasure in saying there are people we supply here able to quite readily handle from 2,000 to 5,000 cases weekly.

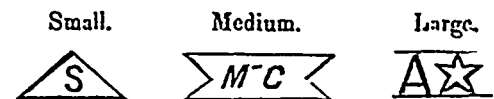
Cases are always made to hold 1250 eggs. In the centre of the case there is a double division thus  If any one wants a half case the seller just takes and saws thorough across the top down between the partition and there remains two cases each containing 625 eggs.

How sold.—Eggs are sold at per 120 per hundred really 120—50 are added to the 1200—sold actually as 1000 for breakage allowance.

Packing.—Now it is more than sensible to sort the sizes small, medium, large.

Small, medium, large.—These all being branded so that by the outside marks, we can instantly tell which is which.

Thus for small there might be :



Each whole case however must contain 1250 eggs. They should be packed in straw and never ; forget, the straw must

(1) Price 50c. address : F. Greigner, LaSalle, N. Y.

be as *dry and clean* as straw can be. Dry absolutely, necessarily fresh, clean and straight.

If the weather is cold, and, anyway, as a general rule, bear in mind that while eggs may be injured in transit from getting no ventilation, it is safer and necessary to keep them snug. Lay therefore in each case at the bottom and up the sides and ends moderately stout paper and when nailing down the tops, cover over the top layer also with paper. Eggs are likely to arrive sound and fresh if kept reasonably warm. And, it will not be at all undesirable to make it plain to the consignee here when eggs are fresh nearly as possible what the age is. Thus, for example, had you been shipping eggs laid in December (the first half) 1 D last half 2 D. The latter could be sold for quite 25 per cent better prices.

Payment. If necessary, an advance upon account of each shipment could be arranged by shippers drawing against each for 70 or even 75 per cent. Draft to be made at 30 days. Bills of lading given up on acceptance. But, we should require exactly what we should give—this is—full security. Shippers would be required to furnish satisfactory guarantee that if any unsound parcels arrived here, we should be covered against risk. We can give bankers guarantee for correspondents protection.

We commend this letter to your kind attention, and if you do not see it personally advantageous to you, will you kindly hand it on to some of your friends it may benefit and with our best respects, we are, dear Sir,

ROGERS, GERDS, & Co.

Wine-Making at Home.

Eds. Country Gentleman—I have an acre of Catawba grapes, and owing to mildew shall have to make them into wine. I have a St. Louis Whitman press (Americus), and wish a cheap and simple receipt for wine from them. On page 705 of vol. 49 of your paper are several receipts, but I find them too expensive, and they make too sweet a wine from Delaware, and Concord. I wish you would explain more fully the process of fermentation.

J. M. B.

Seneca County N. Y.

Mr. Alex W. Pearson, superintendent of the Vineland (N. J.) Wine Company, and writer of the principal article on the page referred to, kindly favours us with the following reply to the above requests:

Eds. Country Gentleman—I have read the directions referred to and find nothing so correct, except it be in the process of fermentation.

A smoother and more generally acceptable wine will result from fermenting the juice on the pomace for about three days; then draw the liquid from the cask into another clean cask to complete its fermentation.

I have discarded the "fermenting tubes," formerly deemed essential to protect the wine from contact with the air. In active fermentation the gas escaping through the bung-hole excludes air. (1) During the after fermentation the cask may be bunged nearly tight, having care to start the bungs every few days to permit escape of any accumulated gas.

There is little danger of acetification in wine thus treated. Pasteur has shown that the *acetous* germ must be present to cause souring of wine. In casks cleaned and disinfected any fruit juice, without addition of sugar, may be fermented into wine, and kept as sound wine, in full casks, free from any taint of vinegar acid.

It was formerly taught that the oxygen of the atmosphere

caused acetification in wine. This is not so. To convert wine into 'vinaigre' there must intervene the germ of *mycoderma aceti*,—"vinegar mother," as we sometimes see it when developed in growth.

If grape juice be fermented in a cask the wood of which is infected by this acetous germ, the product will surely be vinegar.

Some wine makers suppose that their wine casks are cleaned when well rinsed with clear water, through the bung-hole.

The head should be taken out of the cask, and the inside scrubbed with strong solution of lime and potash until the wood shows no sign of acid reaction from chemical test. A cask which has contained vinegar cannot be cleansed fit to hold wine.

By fermenting the juice for some days with the pomace we get an infusion of tannin from stems and seeds. This serves to purify and clarify the wine, and to make it durable. When new it may taste rough, but becomes better the longer it is kept, and is finally superior to wine made of grape juice alone.

Claret made of the natural grape, without addition of sugar, will not be in any degree sweet. All of the sugar of the grape will be decomposed by successive fermentations, which will be renewed each spring, at time of blooming of the grape, for several years.

Possibly your correspondent makes wine from the juice of the pressed grapes, Concord and Delaware, adding syrup as described—5 lbs. sugar per gallon water, one gallon of this to each gallon of must. This will make a sweet wine, as Delaware grapes have naturally a high per cent. of saccharine.

Or he may have tried the process I describe in the last paragraph of the article you republish—fermenting on the pomace for some days, and then adding to the pressed must a syrup made of eight pounds sugar per gallon water, and one gallon of this to two of grape must; this will be $2\frac{1}{2}$ pounds of sugar to each gallon of liquid. Such wine will be sweet when new, but after fermenting for several years, will lose most of its sweetness and become strong in spirit. Two pounds sugar make one pound of alcohol; therefore there will be one and one third pounds spirit from the sugar added, besides that from the sugar of the grapes—possibly 20 per cent of spirit, taken altogether. This is about as much as may be produced in wine by fermentation, and this only under exceptionally favorable conditions. When the ferment has made thus much spirit, this suffocates the ferment. Stronger wines must be made so by the addition of distilled spirit, called the "fortification of wine." Sweet wines are generally thus made, in the "trade." Soon after the wine has gone through its first fermentation and clarified, it is brought up to 25 per cent spirit by adding alcohol, preferably brandy, but generally "cologne spirits," or "deodorized alcohol." Such wine may be relied on to "keep;" it will not ferment again, and is chemically simply a mixture of grape juice and spirits. I have known grape juice to be thus preserved, and called "unfermented wine!"

There are various books on wine-making which may be profitably studied by any one who purposes to engage in the occupation. Lists of such may be found in catalogues of books on applied science. "Études sur le Vin," by the chemist Pasteur, "Schutzenberger on Fermentation," &c.,—these give the general principles. After one has applied these principles for years in practice he will begin to learn how much there is about the business yet to be learned.

Ordinarily wine will make itself. The juice of sound, ripe fruit, in clean casks, fermented at 70° Fahrenheit, will usually develop into a good, sound, "dry" wine—the only sort fit to drink. But some time it does not thus develop, and then we have a puzzle hard to solve.

(1) Which we brewers knew a hundred years ago. A. B. J. F.

Sometimes grape-must will refuse to ferment. The yeast germ is either not present or it lacks vigor. California wine-makers often discuss the trouble of "stuck wines," which term is applied to grape musts which cease fermenting before the sugar of the grape is decomposed. I have had no experience with this phenomenon in the East. Unfortunately the fungi of the vine, the mildews, &c., are also ferments which split up sugar into alcohol and carbonic acid gas. Of seasons when the vine fungi have been peculiarly active I have noticed that vinous fermentations are remarkably violent. In 1877, I fermented, in one cask, 2,600 gallons grape-must with a large addition of sugar, continuously for twelve months, during which the active fermentation never ceased, even with a cellar temperature of 46° F. Finally, after several years of fermentation, it developed into a fine "port wine." This extraordinary action of this cask of wine appeared due to intervention of *Peronospora viticola*, which was that year prevalent and vigorous.

On the other hand, I have noticed that when grapes had been preserved from the fungi of the vine by enclosing the clusters in paper bags, the juice of them is slow to ferment. This enclosure seems to exclude even the "saccharomyces"—the natural vinous ferment germ.

Of course the commercial wine-maker is not bothered with solution of these problems of fermentation. He cuts the knot of difficulty by forcing results. If wine be too sweet, he doses it with acid; if too sour, he cures this defect with a "sali" if too strong, he irrigates it; if not strong enough, "fortifies" it; and somehow—anyhow—compounds a beverage called "wine," which is palatable and potable for those heedless of what they drink.

A. W. P.

WESTERN ILLINOIS.

FERTILIZERS FOR WHEAT—SEEDING TO GRAIN—CAUSE OF POOR OAT CROP.

Our wheat is very poor. For once the threshing machine has verified the predictions of the pessimist. While the quality of the grain is all that could be desired, no one has been agreeably surprised by the quantity, and some found their crop less than they had anticipated after it was harvested. The highest yield in the county of which I have heard was 38 bushels per acre from forty acres. This wheat was grown on a heavy growth of clover turned under last fall. Two neighbors of the fortunate farmer have informed me that in the future they will have a clover sod to turn under for wheat; that this field of wheat proved to their satisfaction that to sow wheat on a clover sod is the proper thing to do. I fear that they are doomed to disappointment. One swallow does not make a summer. While winter wheat on a clover sod has made a superior yield in this case, and in some other that have come under my observation, in at least three times as many cases it has been shown that clover is not a good fertilizer for wheat on our soils. There are several good reasons for this, also. First, a heavy growth of clover plowed under in the fall prevents the thorough compacting of the seed-bed. In ordinary seasons this is a serious matter. Last winter it was not, for we had no weather severe enough to heave out the wheat in even a loose seed bed. But last winter was exceptional, and far oftener than otherwise the clover, by preventing the compaction of the seed bed, will be an evil, though in other directions it may be a benefit. (1)

(1) Quite right. The heavy rain of last fall (1889), acted as a roller, and jammed down the land. A clover ley after two mowings will give a better crop of wheat than if the second is ploughed in.

A. R. J. F.

GENERAL REMARKS.

PHOSPHATES.

Few persons, not directly interested, are aware of the importance of phosphates in agriculture and the magnitude of the industry which produces over three quarters of a million tons of the manufactured article annually. Canadian deposits, now perhaps the principal as well as most valuable source of supply by reason of the richness of the mineral, are a practical monopoly, a colossal syndicate having been formed to control the market. (1) Under these circumstances other possible sources of supply are being investigated. The phosphatic deposits of Cambridgeshire and Bedfordshire are well known, but the geological configuration of another locality in the U. K. also suggests the presence of apatite, and as a matter of fact vast deposits there exist sufficient to supply British requirements. Unfortunately, however, the rock is so impregnated with iron as to render it commercially valueless, the presence of iron being fatal to its conversion into superphosphate. Here then is a glorious opportunity for science to discover the means of eliminating the iron, so that these vast stores of unproductive wealth may be turned to account, and British agriculture rendered independent of foreign supplies.—*Ag. Gazette.*

A SUCCESSFUL DAIRY FARMER.

I have been favoured by a well-known judge of cheese, with some information which appears to me to be sufficiently important to remark upon. My informant tells me that Mr. Henry Lea, a farmer in his neighbourhood, last year made over eleven tons of cheese from forty cows, the herd averaging 5 cwt. 2 qrs. 2 lbs. As each hundredweight was 121 lbs., it is apparent that each animal yielded 670 lbs. of cheese. (2) It may be supposed that a good farmer like Mr. Lea would make a good cheese, but the prices are not what they once were. If, however, he secured no more than 65s per cwt., his gross return for cheese alone would be nearly £18. To this would have to be added at least £1 for whey, probably £2 or more for the calf, something for the whey butter, which even in the best managed cheese dairies is necessarily obtained, and, as I have pointed out, a considerable item for winter milk. This is dairy farming to advantage, even in these days when Denmark and Normandy are in everybody's mouth. Making every possible allowance for low prices and for a surplus yield, respecting which I have no information, Mr. Lea's return from his forty cows cannot be less than £800, in addition to the calves they have dropped.

MANCHESTER GUARDIAN.

AUTUMN FEEDING.

Those who own milking cattle will be wise to remember (says Professor Long) that good sound autumn feeding enables an animal to go through the winter with considerably less effort and loss of condition than is observable in stock which get nothing but what they find in the fields. Three pounds of cotton cake daily will be a great help, and the outlay is to a large extent returned in the future crop should the animal be grazing upon the aftermath of the meadows. At the present time cake is by no means high in price, but it is likely to be higher, and farmers who consume large quantities, and who have not yet purchased, would do well to ob-

(1) Fortunately the syndicate tumbled to pieces soon after this article was published.

A. R. J. F.

(2) A marvellous yield. Our own splendid Gloucestershire grasslands only cause a pro luct of about 450 lbs. of cheese per cow.

tain quotations for winter delivery, always remembering to insist upon a guarantee as to the quantity not only of the oil which good cake contains, but of the digestible matter generally, especially the digestible albuminoids. It is possible, let us hope probable, that corn of all kinds which has been home grown will maintain a higher figure than it has done during the last few years. If this is so, there will be a greater run upon purchased foods, in which case we may suppose that the demand will cause the price to rise.

ORMSKIRK ADVERTISER, August 23rd, 1890.

It seems to me that your correspondent from Nashville, Tenn. (page 608) will be disappointed in results, no matter how carefully he puts the grass seed into the ground. Surely he should sow a greater variety of grasses than orchard grass and blue grass for permanent pasture. Sowing only timothy and clover on the second piece is yet worse. He does not say whether this second piece is for pasture or meadow. If for pasture more grasses should be sown, especially as timothy is not a good pasture grass. If for meadow, the selection is quite bad, as clover and timothy ripen two weeks apart, and either the timothy must be cut before it is ripe or the cutting of the clover must be delayed until it is over-ripe. While there should be a variety of grasses in the meadow it should include only those grasses that ripen at nearly the same time. A fair variety of such grasses and adapted to the soil is possible in almost every locality. In the pasture a greater variety of grasses is needed and is easily possible. Here our object is to get grasses ripening at different times, that there may be a succession of growth. In the latitude of Nashville this is not so important as farther north, yet in Tennessee it should not be ignored. Half a dozen good grasses will produce more pasturage than any three of them. Grasses like neighbors. They do best in a numerous company. And half a dozen good grasses make pasture of better quality than any one of those grasses will make.—*Ex.*

EMPHYSEMA OR HEAVES.

'WITNESS' READER, Ont.—Q.—Would you kindly answer through your Veterinary Column if there is any preventive for horses taking heaves? If anything can be given them on taking that will effect a cure, that is when you notice a horse taking them first. Ans.—Careful attention to the general health of the horse will do more than any medicine can to prevent his taking heaves. A very common cause is feeding on dusty clover hay in large quantities. This should be avoided. Never give a horse hay that is at all dusty. If you are forced to feed such hay give it only in small quantities, shake and moisten it before giving it to the animal. Avoid giving the horse too much mow of any kind. Once a horse has emphysema of the lungs no treatment can effect a cure. Feed very lightly on hay which you will first dampen, feed ground or crushed oats also dampened. Avoid rapid or hard work immediately on coming from the stable. Much relief is sometimes obtained by giving small doses of arsenic in the form of Fowler's solution, one-half ounce to be given night and morning, in the feed or water.—
D. McEACHRAN.

NON-OFFICIAL PART.

Important to Dairymen and Butter Makers
WELLS, RICHARDSON & Co.'s IMPROVED BUTTER COLOR.

Dairymen, Butter Makers, and farmers generally are always deeply interested in the butter trade of our country. This trade within the past few years has become a very important one; and, the great aim of every producer now, is to turn out the finest bran, which are always in great demand for family and hotel use.

One great point which the skilled butter maker always has in view, is the color or tint of his butter. Really first class butter of a pale or whitish color, can never command the high price, that the same quality of butter with a rich golden June tint sells for.

Consumers, or butter users, require to have the sense of sight gratified as well as the sense of taste by an article of food which is placed before them three times a day, and, the butter maker who loses sight of this fact, will find his hard to sell, and unprofitably as well.

To-day the best and most successful butter makers of Canada use the Wells, Richardson & Co.'s Improved Butter Color, and, as a consequence, they are able in winter and autumn to produce a butter equal in color and quality to any that can be made in the month of June.

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MRS. WINSLOW'S SOOTHING SYRUP has been used by millions of mothers for children teething for over fifty years with perfect success. It relieves the little sufferer at once, produces natural, quiet sleep by freeing the child from pain, and the little cherub awakes as "bright as a button." It is very pleasant to taste, soothes the child, softens the gums, allays pain, relieves wind, regulates the bowels, and is the best known remedy for diarrhoea, whether arising from teething or other causes. Twenty-five cents a bottle.

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An old physician, retired from practice, had placed in his hands by an East India missionary the formula of a simple vegetable remedy for the speedy and permanent cure of Consumption, Bronchitis, Catarrh, Asthma and all Throat and Lung Affections, also a positive and radical cure for Nervous Debility and all Nervous Complaints. Having tested its wonderful curative powers in thousands of cases, and desiring to relieve human suffering, I will send free of charge to all who wish it, this recipe in German, French or English, with full directions for preparing and using. Sent by mail, by addressing, with stamp, naming this paper, W. A. NOYES.

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