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THE NOVA SCOTIAN JOURNAL OF AGRICULTURE

Published under direction of the Board of Agriculture of Nova Scotia.

Omnium rerum, ex quibus aliquid adquiritur, nihil est agriculturâ melius, nihil uberius, nihil homine libero dignius.—Cicero: de Officiis, lib. I, cap. 42.

VOL. IV. HALIFAX, N. S., MAY, 1883. No. 34.

THE Provincial Exhibition of Nova Scotia will be held this year at Truro, during the week preceding that of the Dominion Exhibition.

COPIES of the Annual Report of the Central Board of Agriculture of Nova Scotia, have been mailed to all the Presidents and Secretaries of Agricultural Societies throughout the Province.

IN reference to the particulars given in another column, respecting recommendation of Agricultural Committee of $500 for the conveyance of Exhibits to the Dominion Exhibition at Fredericton, it may be stated that the Provincial Government will provide the amount required and make other necessary arrangements. Intending Exhibitors may in the meantime notify the Secretary of the Board of Agriculture of the nature and extent of their proposed Exhibits.

THE offers received for the use of the American Jersey Bull, Litchfield 15th, presented to the Province by F. Ratchford Starr, Esq., have not been as encouraging as was expected. The Executive Committee of the Board have, in consequence delayed acceptance of any of the tenders, and meantime retain management of the Bull. He is located near the Windmill, Dartmouth, and his services may be obtained by any one. In order to limit services as far as possible to thoroughbred Jersey females or high bred grades, the fee is fixed at $5. Persons from a distance may arrange to send their cows to pasturage on reasonable terms. Apply to John Kelly, Dartmouth. Any change in arrangements will be duly announced.

THE Board of Agriculture is encouraging the farmers and the storekeepers in agricultural districts, to lay in supplies of Paris Green, London Purple, and other suitable provender, for the Potato Bug.

THE Halifax and Dartmouth Agricultural Societies, have not yet completed their arrangements for the Fall Exhibition. The Poultry Association has offered to join with them.

MR. YEOMANS, of the Beaver Bank Farm, has imported from Cape Breton, the famous Black Potato, which excited so much interest at last year's Cape Breton Exhibition. It will no doubt soon spread over the Province.

A CORRESPONDENT writes to us that there was quite an excitement in St. John, N. B., a fortnight ago, over the sale of a Jersey Bull, 8 years old, Barry's Eldington, 225, sire of Favonius, owned in Yarmouth by a member of the Central Board of Agriculture of Nova Scotia. The St. John Bull was sold for $2,500 to go back to New York, and three days later another speculator came forward with $4000 for him, having an offer of $5000 in New York. We hope the Agriculturists of Nova Scotia and New Brunswick are not going quietly to sleep, and allowing the enterprising Americans to raid the Provinces of our best Cattle.

MR. D. H. NEWCOMB writes that, "the Bull YOUNG WEATHERBY, purchased at Truro by the Farmers' Agricultural Society of Cornwallis last autumn, is looking lively, and is being well patronised. He is certainly a very superior animal, and we feel quite sure of an improvement in our stock through him."

MR. ACTON BURROWS, the active Secretary-Treasurer of the Manitoba Board of Agriculture, writes to us, under date April 21st, that the ninth Provincial Exhibition will be held at Portage la Prairie, Man., under the auspices of the Board of Agriculture, from October 1st to 6th, next. Entries must be in his hands by Sept. 19th.

FARMING operations have already commenced, and in one or two cases we have heard of seed being put in the ground. The present season is earlier by four weeks than last. Telegraphic reports from Cape North state that no drift ice can be seen from there as far as the eye can reach. The present spring has been an exceptional one in this respect and it is very doubtful if drift ice will make its appearance this season.—*N. Sydney Herald.*

IT will be recollected that a letter from Mr. Julius Inches, Secretary for Agriculture for the Province of New Brunswick, was published in our March number. It contained full details, so far as they could then be given, of the arrangements made for the Dominion Exhibition at St. John, which will open on 2nd October. That

letter was published by order of the Central Board of Agriculture. The Committee on Agriculture of the House of Assembly reported upon it as follows.

A circular from Julius L. Inches, Esq., of Fredericton, New Brunswick, in connection with the Dominion Exhibition for 1883, to be held in that Province, was considered by us. The necessity for providing means to send exhibits to this Exhibition was urged and conceded. We, therefore, recommend a grant of $500.00 for this object.

In this connection, the subject of the selection of stock and other exhibits for said Exhibition was brought to our attention. In order to save the Committee that may be appointed to examine and make such selections, much trouble and expense in going to the different parts of the Province, we recommend as very desirable that these examinations and selections, as far as possible, be made at the time of the Provincial Exhibition to be held at Truro, from exhibits there made.

The Board of Agriculture of Manitoba offers prizes of $50 and $25 respectively, or medals of equal value, at the option of the successful competitors, for the best and second best essays on the most judicious method of farming in Manitoba, either by rotation of crops, or otherwise, so as to produce the largest yield of crops annually from the soil.

The greatest possible conciseness compatible with explicitness is expected. Essays must be written on paper of the size of foolscap and on one side of the paper only. Each essay must be marked in the left hand upper corner of the first page with a distinctive motto. The same motto, together with the writer's name, must be enclosed in a sealed envelope and forwarded with the essay. This envelope will not be opened till after the award of prizes. Essays will be received by Board of Agriculture, Winnipeg, until 6 p. m. on Saturday, September 29th, 1883.

NOVA-SCOTIA APPLES.

We obtain some interesting information relative to the growth, keeping and marketing of apples, from the report of the recent meeting of the Nova-Scotia Fruit-Growers' Association, given in the Halifax Morning Chronicle. That province, on account of its sea surroundings, appears to possess some distinct advantages, not unlike those of Owen Sound in Canada, and the Grand Traverse region in Michigan, which are about the same in latitude, and which are particularly adapted to render fruit long-keeping.

T. S. Whitman related an experiment in keeping a keg of winter apples in perfect condition from February to October, in an ice-house, at a temperature near freezing. Half a dozen kegs of the same kind were spoiled in a few days at a temperature of 55°. He said that the proof that apples after being frozen could be gradually thawed back to good condition, was furnished by the fact that perfect fruit had been picked up from the ground in spring after lying there all winter. Inexperienced people are apt to condemn the quality of good apples through their own carelessness in this respect. A steamer took in a load of fruit at Annapolis in January when the thermometer in her hold stood at 26°, and that cargo was landed in London in the best condition of any ever sent from this side, the whole selling at more than four and a half dollars a barrel. Apples could never be taken out of a cool temperature and put in a ship's hold when the thermometer was 55°, and kept there without spoiling. Hence the importance of special conveyance and special warehouses. He had found that apples kept well at 32° and better at 30°, and that they could not freeze at 25°. Carelessness in shipping sometimes reduced the price two dollars on a barrel, by the bad appearance presented after landing. There is every stimulus for raising the best fruit in connection with careful assorting and shipping. Within ten days from shipping there is a market on the other side of the water, which consumes between four and five million barrels yearly—the city of London alone using a million and a half barrels—all of which has grown up in a very few years. All fruit from this side of the water was at first called American. Then "Canadian" began to make its mark. Now it is classified as Nova Scotian, Canadian and American.

Dr. Robert Burnet, late president of the Ontario Fruit-Growers' Association, gave an excellent address on the management of orchards, including selection of soils, drainage, good cultivation, top-dressing, thinning the fruit, careful handling, selection, and shipping in neat packages. Among varieties, he recommended Golden Russet and Ribston Pippin for Nova Scotia. Mr. Whitman placed the Nonpareil first, then Ribston Pippin and Roxbury Russet. Northern Spy was condemned. It appears that the Gravenstein has stood high as an autumn fruit, from the fact that one man in Kings county had raised over 500 barrels of this sort. Mr. Dickie said that Nova Scotia apples had lately acquired a good reputation in the London market. He took 3,000 barrels just before Christmas last, and sold them all at auction between 11 o'clock that night and 1 in the morning. —*From the Country Gentleman, Albany, N. Y. State.*

On 10th March the thermometer went down to 3 degrees below zero in Somersetshire, England, and one Florist lost two thousand pounds worth of violets.

A NOTE ON SAP.*

Beneath a white Birch tree growing in my garden I noticed, yesterday evening (April 3), a very wet place on the gravel path, the water of which was obviously being fed by the cut extremity of a branch of the Birch about 1 inch in diameter and some 10 feet from the ground. I afterwards found that exactly fifteen days ago circumstances rendered necessary the removal of the portion of the branch which hung over the path, 4 or 5 feet being still left on the tree. The water or sap was dropping fast from the branch, at the rate of sixteen large drops per minute, each drop twice or thrice the size of a "minim," and neither catkins nor leaves had yet expanded. I decided that some interest would attach to a determination both of the rate of flow of the fluid and of its chemical composition, especially at such a stage of the tree's life.

A bottle was at once so suspended beneath the wound as to catch the whole of the exuding sap. It caught nearly 5 fluid ounces between 8 and 9 o'clock. During the succeeding eleven hours of the night 44 fluid ounces were collected, an average of 4 ounces per hour. From 8.15 to 9.15 this morning very nearly 7 ounces were obtained. From 9.15 to 10.15, with bright sunshine, 8 ounces. From 10.15 till 8.15 this evening, the hourly record kept by my son, Harvey, shows that the amount during that time has slowly diminished from 8 to a little below 7 ounces per hour. Apparently the flow is faster in sunshine than in shade, and by day than night.

It would seem, therefore, that this slender tree, with a stem which at the ground is only 7 inches in diameter, having a height of 39 feet, and before it has any expanded leaves from whose united surfaces large amounts of water might evaporate, is able to draw from the ground about 4 litres, or seven-eights of a gallon of fluid every twenty-four hours. That at all events was the amount flowing from this open tap in its water system. Even the topmost branches of the tree had not become, during the fifteen days, abnormally flaccid, so that, presumably, no drainage of fluid from the upper portion of the tree had been taking place. For a fortnight, therefore, the tree apparently had been drawing, pumping, sucking—I know not what word to use—nearly a gallon of fluid daily from the soil in the neighbourhood of its roots. This soil had only an ordinary degree of dampness. It was not wet, still less was there any actually fluid water to be seen. Indeed, usually all the adjacent soil is of a dry kind, for we are on the plateau of a hill 265 feet above the sea and the level of

* Read by Professor Attfield, F.R.S., at an evening meeting of the Pharmaceutical Society, April 4th, 1883.

the local water reservoir into which our wells dip is about 80 feet below the surface. My gardener tells me that the tree has been "bleeding" at about the same rate for fourteen of the fifteen days, the first day the branch becoming only somewhat damp. During the earlier part of that time we had frosts at night and sunshine but with extremely cold winds during the days. At one time the exuding sap gave, I am told by two different observers, icicles a foot long. A much warmer, almost summer temperature has prevailed during the past three days and no wind. This morning the temperature of the sap as it escaped was constant at 52° F., while that of the surrounding air was varying considerably.

The collected sap was a clear, bright water-like fluid. After a pint had stood aside for twelve hours there was the merest trace of a sediment at the bottom of the vessel. The microscope showed this to consist of parenchymatous cells, with here and there a group of the wheel like or radiating cells [?] which botanists, I think, term sphere-crystals. The sap was slightly heavier than water, in the proportion of 1005 to 1000. It had a faintly sweet taste and a very slight aromatic odour.

Chemical analysis showed that this sap consisted of 99 parts of pure water with 1 part of dissolved solid matter. Eleven-twelfths of the latter was sugar.

That the Birch readily yields its sap when the wood is wounded is well known. Philips quoted by Sowerby, says:—

> "Even afflictive Birch
> Cursed by unlettered youth, distils
> A limpid current from her wounded bark,
> Profuse of nursing sap."

And that Birch contains sugar is known, the peasants of many countries, especially Russia, being well acquainted with the art of making Birch wine by fermenting its saccharine juice.

But I find no hourly or daily record of the amount of sugar-bearing sap which can be drawn from the Birch, or of any sap from any tree, before it has acquired its great digesting or rather developing and transpiring apparatus—its leaf system. And I do not know of any extended chemical analysis of sap either of the Birch or other tree.

Besides sugar, which occurs in this sap to the extent of 616 grains, nearly 1½ oz., per gallon, there are present a mere trace of mucilage, no starch, no tannin, 3½ grains per gallon of ammonical salts yielding 10 per cent. of nitrogen, a distinct trace of nitrates, 7.4 grains of nitrates containing 17 per cent. of nitrogen, no chlorides, or the merest trace, no sulphates, no sodium salts, a little of potassium salts, much phosphate and organic salts of calcium, and some similar magnesian compounds. These calcareous and magnesian substances yield an ash when the sap is evaporated to dryness and the sugar and other organic matter burnt away, the amount of this residual mineral matter being exactly 50 grains per gallon. The sap contained no peroxide of hydrogen. It was faintly if at all acid. It held in solution a ferment capable of converting starch into sugar. Exposed to the air it soon swarmed with bacteria, its sugar being changed to alcohol.

A teaspoonful or two of, say Apple juice, and a tablespoonful of sugar put into a gallon of such rather hard well-water as we have in our chalky district, would very fairly represent this specimen of the sap of the Silver Birch. Indeed, in the phraseology of a water-analysist, I may say that the sap itself has twenty-five degrees of total, permanent hardness.

How long the tree would continue to yield such a flow of sap I cannot say. Probably until the store of sugar it manufactured last summer to feed its young buds this spring was exhausted. Even within twenty-four hours the sugar has slightly diminished in proportion in the fluid.

As a chemist and physicist myself, knowing something about capillary attraction, exosmose, endosmose, atmospheric pressure and gravitation generally, and the movements caused by chemical attraction, I am afraid I must concur in the opinion that we do not yet know the real ultimate cause or causes of the rise of sap in plants. *Ashlands, Watford, Herts, April 4.—Gardeners' Chronicle.*

THE UNEARNED INCREMENT.

[The following interesting letter from the Duke of Argyle appeared in the *Times*.]

The "unearned increment" which may arise in the price of an article, or of any possession, can only mean such increase of that value as may be brought about apart from any direct exertion on the part of its owner or possessor. Now, as the value of every article is always due to two elements—supply and demand—of which the owner's or producer's exertions can never be more than one, it is clear that every increase in the value of every conceivable possession must, in this sense, and in this measure, be "unearned."

To those who follow up this consideration it will be at once apparent that the phrase "unearned increment" is honeycombed with fallacies, and represents nothing more than a vague, ill-digested conception of the unquestionable fact that the productions and possessions of men sometimes receive great and sudden enhancements of value from causes to which they themselves did not contribute—from the exertions of others, or from the general progress of society.

This is quite true. But it is not true that this fact applies exclusively, or even specially to any one class. It is a fact which applies generally, if not universally, to all ranks and conditions of men. To no class does this fact apply more conspicuously than to the class which lives by the wages of labour. Great and sudden rises in the value of labour are almost always due to causes independent of the workman. The suggestiveness of the mind of one man, the enterprise of another, the capital of a third, each or all of these are continually opening new branches of industry, creating new demands for labour, and giving to wages sudden, and often enormous, increments of value.

It is needless to say that all men—and there are thousands—who make fortunes in the share market or in other investments of capital, are men who gain entirely by changes in value which they do not produce, and to which they do not even contribute. In commerce, again, men live on increments of value which they may forsee, but which they never cause; and very often enormous fortunes are made by enhancements of price which those who profit by them have neither forseen nor produced.

The same principle applies to manufactures, which are, of course, only a separate branch of commerce. But there are some kinds of success in manufacturing industry to which, I admit, this principle hardly applies at all. There are cases in which men of original and inventive genius have given some new mechanical embodiment to mind, and, to use the expression of Lord Bacon, have "endowed the human family with new mercies." Such is the success of my distinguished friend, Mr. James Nasmyth, whose most interesting and instructive life has just been published. There are others, not less distinguished, who are still in the full career of their activity, and whose names will occur to all. It can hardly be said that any possible enhancement in the price of their productions can be "unearned" by them. The world may always be said to owe them far more than it can ever give. These are the kings and magnates of the industrial world. They constitute, of necessity, a small class; and, of the thousand others who have made money in manufactures, one thing only is certain about them, and that is, that they do not belong to it.

For behind this small class—*longo intervallo*—comes the great mass of those who are engaged in manufacturing pursuits, with every degree in the scale of proportion between intellectual merits and material results, from those who by patient industry have built up a just reputation for some special honesty in material, or some special honesty in work, to those who, by what may be called in comparison, the mere mechanical weight of capital, have extinguished minor industries

and have established in some one article of general demand an immediate and a lucrative monoply. All of these, from the least to the greatest, depend largely for their success upon "turns of the market," upon changes of value to which they contribute nothing, and upon currents of demand which flow entirely from the general progress of society.

I do not know in what sense the President of the Board of Trade may have himself "toiled or spun;" nor how far, like most of us, he may have benefited by the toiling and spinning of those who have gone before him; nor how far he may have inherited resources which do not fail when he is sleeping. Not being a Communist, I hold that the profits of capital are as well "earned" as the wages of labour." It is enough to know that in a great community he has lived an active and a useful life. I hope he may continue to do so for many years to come, and that in the course of them he may learn that there have been other toilers and spinners than in the class to which he himself belongs. Perhaps even he may come to know that none have done better work than that class which has been reclaiming and improving the soil of England for centuries before there was a chimney in Manchester, or a forge in Birmingham.

Vulgar errors are more common in the science of politics than in any other. In the natural sciences they arise from mere ignorance of facts. But in politics they arise even more from class prejudices, and sometimes from class antipathies. Such is the error—one among many—that the value of agricultural products, more than the value of any other products, depends upon the general progress of society; or that they rise in price more certainly and more steadily than others; or that increments in value of agricultural land have been secured without a proportionate application of intelligence, and a proportionate expenditure of capital

On this matter I have had a pretty large and a pretty long experience. That experience, extending over more than five-and-thirty years, enables me to assert with confidence that the increased value of agricultural land has been during that period—taking times of depression and times of prosperity together—less than ordinary interest on the enormous outlay which has been required to establish and maintain it. It is often said that one-half the world does not know how the other half lives. The speech to which I refer is a curious example. It is, however, not the first time I have observed, that there are some members of the manufacturing class who have no idea of any industry which is not represented by a mill, or of any expenditure of capital which is not typified by a chimney-stalk.—ARGYLL, *Cannes, April* 11.—*Agricultural Gazette.*

FINANCIAL STATEMENT.

HILLSBURGH AGRICULTURAL SOCIETY, 1882.

RECEIPTS.

Balance in Treasurer's hands from last year		$ 70 04
Interest from J. F. Miller		85
Rec'd from J. A. Purdy for bull service		35 25
do Benj. Rice do		27 00
Sale Bull S. Hammond to W. Eaton		15 00
do Dingo to Benj. Rice		15 00
Government Grant		162 01
Sold Ayrshire heifer, W. G Clarke		70 00
Rec'd from O. Miller for calf sold		7 62
do John Nichol Boar sold		13 33
Rec'd for door fees at Exhibition		8 47
do Interest on monies lent		5 00
do Membership Fees		103 00
		$532 62

EXPENDITURES.

Secretary's salary, postage 1881 &c	$10 60	
For Treasurer's book and postage	67	
Henry Burrill for Lily 6th	60 00	
Expenses on do	4 12	
Obed Miller half purchase of bull and heifer	87 58	
Discount on Government Draft	40	
G. A. Purdy keep of bull S. Hammond	51 00	
Benj. Rice keep of bull Dingo	51 00	
Printing 125 Prize Lists	3 50	
Benj. Rice's bill	10 65	
Building exhibition tent and watching	14 60	
Printing exhibition hand bills	1 50	
Premiums at exhibition	81 30	
Eaton to keep bull (1883)	19 00	
Benj. Rice bill ommitted in 1881	3 50	
Paid for Devon Bull	25 00	
do Ruggles for grade Boar	13 00	
do Secretary salary and postage for 1882	11 92	
Paid use of hall 11 nights at 25c.	2 75	
		452 08
		$80 54

We certify this to be a true statement of above Society's Financial Accounts.

EDWARD CLARKE, *President.*
W. T. NICHOL, *Secretary.*

SHEEP HUSBANDRY IN COLONIAL TIMES.

"Sheep were first introduced into the Colonies by the London Company, in 1609, at Jamestown, in Virginia, where in 1649 they had increased to about three thousand. They were first brought to Massachusetts about the year 1633, and and were kept on the island in Boston Harbor to protect them from the wolves and Indians. Charlestown in 1651 had four hundred sheep, and Lynn had considerable flocks which were kept on Nahant under a common shepherd. Hutchinson gives the number of sheep in Massachusetts in 1640 as three thousand. The Dutch West India Company in 1625 first introduced sheep into New Netherlands, and others were imported in 1630. But in 1643 there were not more than 16 sheep in that Colony, and ewes were worth from $8 to $10 each.

"On the 14th of May, 1645, the General Court of Massachusetts, '*having an eye to the good of posterity,* knowing how useful and necessary woollen cloths and stuffs would be for our more comfortable clothing, and how profitable a merchandise it is like to be to *transport to other parts,* doth hereby desire all towns in general and every one in particular, seriously to weigh the premises, and accordingly that you will endeavor the preservation and increase of such sheepe as they have already, as also to procure more at all convenient speed into the several towns by all such lawful ways and means as God shall put into their hands,' etc.; desired 'to know who will buy sheepe at the rate of 40s. apiece, under three years ould.' Wolves were so destructive of sheep that in 1648 an order was made offering bounties for every wolf killed of 30s. to an Englishman and 20s. to an Indian. Premiums of less amount had been previously offered and paid for several years, and were renewed at different times to nearly the close of the last century. In 1782 Massachusetts offered £4 for every wolf's head and £1 for every whelp. No less than $1,250 were levied in the little Swedish Colony on the Delaware, in 1677, as *bounties on wolves' heads.* In 1654 the Assembly prohibited the exportation of sheep, and even the killing of any for food under two years of age, save for the use of the owner's family.

"Connecticut, in 1640, made some useful orders respecting the cultivation of hemp and flax and the improvement of sheep. The Governor of the Swedish Colony on the Delaware was instructed to encourage the propagation of sheep with a view to a large export of wool to the parent State. The Assembly of Virginia in 1657 prohibited the exportation of sheep, and in 1662 ordered that no wool should be exported under a penalty of fifty pounds of tobacco for every pound so exported. It is probable that this prohibition had the desired effect, for in the early part of the 18th century sheep were abundant, yielding good fleeces but wool was so cheap, we are told, that sheep were shorn only for the purpose of cooling them.

"The General Congress met in september, 1774, and, in the resolutions passed on the 20th of October, requested the people to use their utmost endeavors to improve the breed and increase the number of sheep, killing as few as possible and not exporting any, but selling on moderate terms to the neighbor who might need them. In 1775 the first act of the Assembly of Pennsylvania was to recommend the people to abstain from eating, and the butchers from killing the sheep, and the Association of Butchers signed an agreement to that effect in December. It was ascertained in the following year that the number of sheep killed was 20,000 less than in 1774. The Congress of Deputies, which met at Annapolis, in

December, 1774, resolved to encourage the breeding of sheep and to promote the woollen manufacture. The Provincial Congress of Massachusetts, the same month, recommended the people to improve their breed of sheep and the greatest possible increase of the same, the use of their own woollen manufactures and a very careful sorting of their wool, so that it might be manufactured as much as possible into the best goods.

"A Committee of the Convention of Virginia reported on the 27th of March, 1775, a series of resolutions in favor of domestic manufactures, and urged that after the first of May next no person should use in families, unless in case of necessity, and in no case sell to butchers, or kill for market any sheep under five years old. The beneficial effects of these restrictive measures were felt during the Revolutionary War, which shortly followed, in the abundance of wool produced suitable for clothing."—*Mr. E. Young, in "America."*

CATERERS FOR CATTLE.

There can be little doubt that during the coming season the new method of preserving herbage for future use will be largely experimented with. How far ensilage will deserve the eulogy lavished on it—and the hopes which it is said to justify—remains to be seen. As an auxiliary process, it may be capable of rendering occasional service to the grazier; and it seems likely that these services will be most conspicuous earlier and later in the year than the usual time for curing hay by direct sunshine; but nothing is at all likely to supersede the world-old methods of making hay and carrying corn in harvest; nor is well saved hay ever likely (as an article of food on a farm for all kinds of stock) to be put behind forage cured in any other fashion—on or off a stack, in a pit or out of one. No food can be kept so long uninjured by keeping as a sound haystack.

Now the old method of making hay, upon what is called "the rule of thumb," is very generally understood. Upon almost every occupation, large or small, there is some one sufficiently familar with the appearance and "feel" of grass fit to cut, and to carry, to make it at least an even chance that, in an average season, average hay will be made. To make *first-rate* hay does require an exercise of thought and acquired knowledge; but fair hay is made, almost everywhere, in a fair midsummer, without special training; that is to say, the universal practice of haymaking is no evidence at all as to a population having mastered principles.

But ensilage cannot either at present be expected to be made by more "rule of thumb" *i.e.*, there is no hoarded common stock of knowledge laid up from centuries of experience to fall back on, nor is it ever likely to be so made. Ensilage is not only the saving from destruction of what would otherwise be wasted for want of sunshine, but also it is the result of converting, by judiciously controlled fermentation, coarse provender into appetising, wholesome, and productive food. The makers of hay, on the stack, by Neilson's or similar processes—or the curers of grass or corn stalks in a pit—are really good cooks. They, by artistic skill, convert inferior parts of the stores on a farm into cattle diet equal to the best. Both employ processes for which a knowledge of principles and a readiness to seize the right minute to apply them, are essentially necessary.

The thanks of the agricultural community will certainly be due to those who are recording experiments with ensilage. The analyses made and published are no doubt of great importance, but even greater is the interest attached to the return made in flesh, milk, and health of the cattle, &c., who have consumed the food. It is by them that the decisive verdict will have be pronounced. But whether it be the chemist in his laboratory, or the animals in their stall, the lessons which each is capable of conveying will fall barren unless there be the intelligence to collect exact particulars and to report what is ascertained. No one doubts that the training of the chemist will secure that he will duly records his facts. Is it equally certain that the owner or attendant of cattle will? Most people have been connected with schools at one or other periods of their lives, and know the stir and stimulus to the teachers, and the extra attention of the scholars, which an approaching visit of the inspector involves. Ensilage comes to England as an Inspector of Farm Education even more than as a cattle-cook.—*Agricultural Gazette.*

HISTORY OF THE PICTOU CATTLE DISEASE.

No. VI.

Preliminary Report on the Disease of Cattle at Pictou, Nova Scotia, and adjoining Districts, addressed to Hon. J. H. Pope, Minister of Agriculture, by D. McEachran, F.R.C.V.S., Inspector of Stock.

[Continued from April Number.]

K.—Farm of William Sobey, West River Road.

Water sample No. 8, from well at back of dwelling-house, where cattle are watered in winter time. The well is within a few yards of the kitchen door, covered up and fitted with a pump.

Water somewhat turbid, portions of insects and vegetable debris; good lustre, almost colourless; no odour.

Total solids, 34·4 grains per gallon.
Fixed do 24·4 do
Residue, very light coloured; became of a slight grayish tint, changed but little, in fact. (Weighed with difficulty; gaining fast.)
Chlorine, 9·1 grains per gallon.
Ammonia, free or saline:
Grains, ·0322 per gallon.
M.G., ·46 per litre.
Ammonia, albuminoid or organic:
Grains, ·0365 per gallon.
M.G., ·195 per litre.
Metals—Iron, faint trace.
Hardness = 10·3 deg.
Nitrates, present, marked.

The large amount of total solids, of free or saline ammonia, the well marked presence of nitrates, and the large amount of chlorine, all point to probable sewage contamination. The albuminoid ammonia is also nearly ·2 per million. The proximity of the dwelling-house and stables is favourable for the passage of impure drainage into the well.

Microscope.

Portions of insects; Infusoria; Rhizopods; Rotifera; Fungus filaments.

Water sample No. 9, from pools in small sphagnous swamp in Mr. William Sobey's pasture; the ordinary watering place of cattle in the summer time.

Water very turbid; light brownish yellow.
Stable (?) odour; cyclops.
Total solids, 5·5 grains per gallon.
Fixed do 5 do
Chlorine ·3 do
Ammonia, free or saline:
Grains, ·0707 per gallon.
M.G., 1·01 per litre.
Ammonia, albuminoid or organic:
Grains, ·0784 per gallon.
M.G., 1·12 per litre.
Metals—Iron, slight trace.
Hardness = 1·4 deg.
Nitrates, *nil.*

Microscope.

Desmideæ; Entomostraca; Diatoms, Infusoria; Bacteria; Rhizopoda; Vegetable debris, Portions of insects; Conferva.

L.—Farm of John Arbuckle, West River Road, in Pictou town.

Water sample No. 10, from well used in winter and spring for cattle, not in summer, when the cows get water at roadside, "or anywhere."

Water slightly turbid, almost colourless, moderate lustre; odour old, woody (?) or fœcal (?) or both.
Total solids, 6·5 grains per gallon.
Fixed do 4.5 do do
Residue became brownish black, wavy, patchy.
Chlorine, 1 grain per gallon.

Ammonia, free or saline:
Grains, ·2156 per gallon.
M.G., 3 08 per litre.
Ammonia, albuminoid or organic:
Grains, ·0413 per gallon.
M.G., ·59 per litre.
Metals.—Iron, trace.
Hardness = 1·9 deg.
Nitrates, *nil.*

Microscope.

Entomostraca; Fragments of insects; Vegetable debris; Diatoms; Bacteria; Mineral particles; Infusoria; Acarina; Armed ovoid bodies.

Water sample No. 10½, from well dug into sandstone rock. Water used for domestic purposes and sometimes for cattle.

Water very slightly turbid, brilliant lustre, stale, woody (?) odour, little sediment.

Total solids, 4·5 grains per gallon.

Residue of a very light brown, became dark and then grayish.

Chlorine, 1·1 grains per gallon.

Ammonia, free or saline:
Grains, ·04004 per gallon.
M.G., ·572 per litre.
Ammonia, albuminoid or organic:
Grains, ·012048 per gallon.
M.G., ·172 per litre.
Metals, *nil.*
Hardness, 3 deg.
Nitrates, *nil.*

Microscope.

Scales of insects; Vegetable debris; Mineral particles; Infusoria (Flagellata); Ovoid bodies; Conferva.

M.—New Glasgow.

Water sample No. 14.

Water of good lustre, no odour, good taste, yields little sediment on standing.

Total solids, 7·5 grains per gallon.
Fixed do 5·5 do

Residue almost colourless, became brownish during incineration, and ultimately greyish.

Ammonia, free or saline:
Grains, ·02058 per gallon.
M.G., ·294 per litre.
Ammonia, albuminoid or organic:
Grains, ·00364 per gallon.
M.G., ·052 per litre.
Chlorine, 1·5 grains per gallon.
Hardness = 5·25 deg. (Clark.)
Metals—Iron, minute trace.
Nitrates present.
Oxidizable matter (organic):
·0336 grains per gallon.
·48 M.G. per litre.
Nitrous acid, *nil.*

Microscope.

Bacteria, Bacilli, Spirilla; Rhizopoda (Actinophrys, Amœba); Infusoria (Monas); Portions of Entomostraca; Mineral particles; Vegetable debris; Confervoid filaments; Anguillulæ.

To facilitate comparison the principal items of the several analyses are thrown into a tabular form as follows:—

No. of Sample.	Solids in Grains per Gall. Total.	Solids in Grains per Gall. Fixed.	Chlorine in Grains per Gall.	Ammonia in Milligrammes per Litre. Free.	Ammonia in Milligrammes per Litre. Albuminoid.	Hardness in Degrees (Clark).	Metals.	Nitrates.
1	2·5	.....	·35	·226	·203	3	Iron, trace.....	Nil.
2	3·0	2·5	·8	·08	·008	2·5	do slight trace.....	Nil.
3	2·5	0·0	1·9	1·1	·08	3·0	do present.....	Nil.
4	3·0	2·0	·8	·106	·16	1·5	do trace.....	Nil.
5	6·0	1·0	2·25	1·396	1·63	4·0	do present (manganese).	Nil.
6	20·0	11·0	0·5	·34	·26	4·0	do slight trace.....	Nil.
7	34·0	11·0	0·5	·08	·63	4·0	do minute trace.....	Present.
8	5·5	2·0	0·5	·16	·195	10·3	do	Nil.
9	6·5	4·5	0·5	1·01	1·12	14·9	do slight trace.....	Nil.
10	45·0	.....	1·1	3·08	·59	3·4	do traces.....	Nil.
11½	20·0	3·5	1·1	·572	·172	4·4	None	Nil.
12	7·0	.....	1·7	·33	·054	1·7	Iron, minute trace.....	Present.
13	4·5	.....	1·6	·451	·104	1·7	do	Nil.
14	7·5	5·5	1·5	·284	·052	5·25	do	Present.

REMARKS ON HERBAGE.

A careful examination was made of the herbage in the pastures and fields of the several farms visited. The principal grasses and clover, &c., of agricultural value were the native fescue grass, aira, timothy, red and white clover, oxeye, &c. Of noxious plants, the following may be noticed: Lobelia inflata, Kalmia angustifolia, Ranunculus acris, Polygonum hydropiper. The pastures throughout the district are remarkable for the large quantities of weeds growing in them. The most conspicuous herbaceous plants in many of the pastures (with a single exception to be presently named) were the native solidagos and asters, and other perennials that are usually avoided by the cattle, although not known to have injurious effects.

The most remarkable plant in the district is a European weed that has become naturalized around the town of Pictou, and in some cases fills whole fields to the exclusion of useful herbage. It is a tall biennial or short-lived perennial with divided leaves and large clusters of showy yellow flowers, in shape like those of the aster.

Its botanical name is *Senecio Jacobæa*.
English: Ragwort.
Scotch: Weeby.
French: Jacobée.
Italian: Herbe di Sanct Jacomo.
German: St. Jacobskraut. *

The range of this plant is to some extent coincident with the prevalence of the cattle disease, and many persons in the district believe that it is either the cause of the disease or is in some way connected with it. It is to be observed, however, that this plant is not uncommon in Britain and other countries in Western Europe, growing in pastures where it is left untouched by the cattle, and no evil effects have ever been attributed to it, so far as can be ascertained from a careful search through the writings of botanists and agriculturists of those countries.

Ergotised grasses were carefully looked for in the Pictou pastures, but none were found.

I have the honour to be, Sir,
Your most obedient servant,

GEORGE LAWSON, PH.D., LL.D., F.I.C.

A. W. H. LINDSAY, M.D., has acted as Laboratory Assistant during this investigation.

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* Mentzelii Index Nom. Plantarum, Berlin, 1682.

MILK AND BUTTER YIELD OF SCOTCH POLLED CATTLE.

Not long ago a Kansas newspaper said: "While we are willing to accord to the Polled Angus and Hereford a high place among the beef-producing breed of cattle, they are nearly worthless as milkers." This was an extreme expression of what seems to have been a widely-accepted idea of these cattle, especially among those who have had no direct acquaintance with the Angus or with the Galloways. That this belief is not justified by the facts will, we think, become a generally recognized fact, when an accurate knowledge of their performances at the pail and the churn shall have been made known. Unfortunately many of those who have had the best opportunities for observing these breeds have considered their milk as of little moment beyond the raising of a vigorous calf, and have made little if any effort to develop the milking qualities of their cows. Under these circumstances a lack of evidence upon this point is to be expected, yet there is some testimony showing that, in the volume and the quality of their milk, the cows of the Scotch polled breeds are at least equal to those of any other beef breed. They excel some others in giving enough milk to raise vigorous, large and hardy calves, unaided by a nurse even under very unfavorable circumstances of food and

climate. No claim for excellence as milk givers has been made for the black polls, yet there is proof that they yield a fair quantity of milk of a quality unsurpassed by that of any other beef breed.

As long ago as 1840 one of the best authorities upon live stock in Great Britain wrote of the Galloways that their milk, although small in quantity, was rich in cream. The Michigan State Board of Agaiculture has said in its official annual report: "The cows are not remarkable for the quantity of milk, but it is very rich, and affords a comparatively large proportion of butter of the finest quality." Youatt says of them that a cow may average six or eight quarts per day during the five summer months, besides feeding her calf, and that during the next four months she may give half that quantity, running dry the other three months of the year. This would amount to from 1,260 to 1,680 quarts per year, besides supporting the calf.

The testimony of breeders and others of the present time, who know the Scotch polled cattle, is that the cows are exceptionally good mothers, giving very rich milk, quite enough to answer all the requirements of a strongly-growing calf. More than this will scarcely be required by the western stockman, and less is obtained from the average milk cow of this country. The Earl of Airlie, an eminent breeder of Angus cattle, has written of the breed as follows: "I have at present seventeen pure polled Angus cows in my diary. The greater number of those give from 12 to 14, and sometimes 16 Scotch pints, for a considerable time after calving. The milk is admitted to be much richer than that of either the Short-horn or the Ayrshire. As regards the length of time for which they will continue to give milk, my cow Belle of Airlie (1959), dam of Belus (749), as pure a polled animal as any in the herd book, used to be milked all the year round. Last year, when I was from home, they left off milking her about a month before she calved, and she died of milk fever, induced, as I believe, by the circumstance that she had not been relieved of her superabundant milk."

In reply to inquiries by Frank B. Redfield, of Batavia, N. Y., Lord Airlie wrote: The Scotch pint to which I referred, is a measure of twelve gills, equal to three Imperial pints, or one and one-half Imperial quarts. When I wrote on this subject I had some cows that (newly calved) gave fourteen Scotch pints, or twenty-one English quarts, and one cow I think, fifteen pints, or twenty-two and and one-half English quarts. I have now some cows that are giving as much as twelve Scotch pints, or eighteen English quarts daily, though quite three months calved. The cows are milked three times a day, which I believe to be the usual practice in Scotland. I do not know the weight, as the pint and quart are measures of capacity, so that the weight depends on the specific gravity of the milk. But it is admitted, I believe, that the milk of the polled Angus is richer in cream than that of either the Short-horn or Ayrshire."

The quart in use in this country is equal to 0.83311 English Imperial quarts. Therefore 21 Imperial quarts (14 Scotch pints) equal 25.2 of our quarts; 15 Scotch pints, 22½ Imperial quarts, equal 27 of our quarts.

Thus it appears that these Angus cows were giving 21 3-5 to 28 4-5 quarts of rich milk per day. Recently published records of the Jersey cow Value 2d 6844 state that from 16 quarts of her milk 3½ lbs of butter were obtained; and a day or two later, from 18 quarts 4 lbs. were made, or about one pound from four and a half quarts. Of the Jersey cow Oonan 1485 it is said that, in 1881, from about 84 quarts of her milk 14½ lbs. of butter were made, or one pound for 5 4-5 quarts of milk. If we suppose that the milk from Lord Airlie's cows was only one half as rich as that of those two Jerseys, the yield of butter would have been from 1 4-5 to 2¼ lbs. per day.

Of the quality of the milk of these two breeds of polled cattle we have, unfortunately, as yet no definite proof as, if careful tests have been made to determine accurately the quantity of butter which a specified volume of milk will produce, the results have not yet come under our observation. We must, therefore, for the present, content ourselves with quoting the opinion of those who have had an opportunity of learning the truth. Messrs. Palmer & Son, Boscobel, Wis, write of the Galloways: "They are not large milkers, but give good milk; in fact, we consider them good butter cows, and their butter is high colored." Again, after further observation, they write: "We tell cheesemen and milk pedlers to let these cattle alone, as they do not give a large flow of milk; but for butter they are unequalled by any of the beef breeds, nor are they excelled by the Channel Island cattle in the quality of their butter, although the latter exceed the Galloways largely in the quantity of butter."

Mr John Snell, of Edmonton, Ont., has said that the quantity of milk given by his Galloways and his Short-horns was about equal, but that the milk of the Galloways was much richer than that of the others. Thomas McCrae, Guelph, Ont., says; "We do not breed them for milking purposes: but the best milking cows we have had of any breeds have been the Galloways." He adds that by careful selection good milking families of Galloways can be secured; this opinion seems to be fully warranted by the evidence we have given. That much more testimony of like tenor can be brought out by careful observation is more than likely. Probably hundreds of cows which now have a local reputation as good milkers, would, under an accurate and painstaking method of testing, show that they have capabilities which entitle them to rank with the great butter-makers. It is just such proof as this, of capability for producing valuable food, that the future buyer of cattle will demand; and that breed which cannot furnish such proof will certainly be left far behind its more successful rivals, and eventually be forgotten, Empty sound and pretty form and color will fail to find favor if they be not supported by truthful records of productive power, which has been represented by a creditable showing of quarts, pounds or dollars.—*From the Breeder's Gazette.*

EVOLUTION OF THE AMERICAN TROTTING-HORSE.

The American trotting-horse is an example of a new breed of animals in process of formation. As yet it can hardly be called a definite breed in which the special and distinctive character is either fully developed in quality or satisfactorily fixed by heredity. Great progress has, however, been made, many individual animals have attained great speed, and all the better ones have derived their trotting excellence, in part, at least, through heredity.

The origin of most breeds is involved in considerable obscurity, as to how much they are due to conscious and how much to unconscious selection, what motives led to this selection, how far the enhancement of the special qualities have been due to physical environment, and how far to education, training, nourishment, or cultivation. The formation of this new breed is so recent, the development of a special quality has been so marked, there is such an abundant literature pertaining to its history, the system of sporting "records" is so carefully planned and comprehensively conducted, and withal has become so extensive, that we have the data for a reasonably accurate determination of the influences at work which led to this new breed being made, the materials of which it is made, and the rate of progress of the special evolution.

It is as an implement of gambling and sport that the trotter has his chief value to the biological student. Sporting events are published or recorded as the mere everyday use of animals is not, and the records of races give numerical data by which to measure the rate of progress. Similar data do not exist for the study of the evolution of any other breed.

Incidental to the preparation of a paper pertaining to this matter for farmers and breeders, I have compiled and collated certain data which have a scientific as well as economic value, the more interesting portion of which I condense for this paper.

The horse has several gaits which he uses naturally, that is, instinctively. And, besides those which are natural, he has been taught several artificial ones, some of which have been much used, particularly in the middle ages. But to trot fast was not natural to horses; when urged to speed they never assumed it, and until within a century the gait was neither cultivated nor wanted by any class of horsemen. A breed of fast trotters, had it been miraculously created, would doubtless soon have perished in that it would have had no use, satisfied no fancy, and found no place in either the social or industrial world as it then was.

Before the present century the chief and almost sole uses of the horse were as an implement of war, an instrument of sport and ceremony, an index of rank and wealth, and an article of luxury.

For all these uses, as then pursued, a fast trotter was not suited, nor was he better adapted to the heavy coaches over rough roads, or the slow waggon-trains of armies. The horse best adapted to all these, however much he may have varied as to size, strength and fleetness, was one whose fast gait was the gallop or run rather than the trot. For leisurely horse-back travelling the ambling gait (or *pacing* gait as it came to be called in America) was preferred. With increasing use of horses for draft, certain heavy but slow breeds were developed in the Old World, of which the Dutch, Clydesdale, and Norman breeds are examples.

The causes which led to the cultivation of the trotting gait in this country, and the evolution of a breed with which it should be instinctively the fast gait, were various, and the separate value of each as a factor in the problem would be very differently estimated by different persons studying the subject from different points of view. Now that he is so valuable and plays such a part as a horse of use, it is easy to see why a breed of trotting roadsters should be produced to meet certain important demands of our modern civilisation. But this does not explain how the process actually began.

Reasoning *a priori*, the trotter, as a horse of use, should have originated in western Europe; as a matter of fact, he not only did not begin there, but he was unpopular there until well developed here. Locomotives began to draw armies to the battle field, the war horse declined in actual as well as relative importance, the modern, light, steel-spring, one-horse, convenient business waggon as well as the modern buggy came into common use after trotting as a sport was established, and after the gait had been extensively cultivated and bred to. The trotting horse is specially adapted to various modern uses, but these uses followed his development, rather than led it, although in later days this factor has been an important one in the rate of progress.

The influences which originally led to the starting of the breed were more social than economical; a similar fact a century earlier marked the founding of that famous running breed, the English thoroughbred. The origin of the trotter, however, was not so simple as that, and several diverse social factors were involved, only the chief of which will here be noticed.

(To be Continued.)

Advertisements.

Resolution of Provincial Board of Agriculture, 3rd March, 1882.

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