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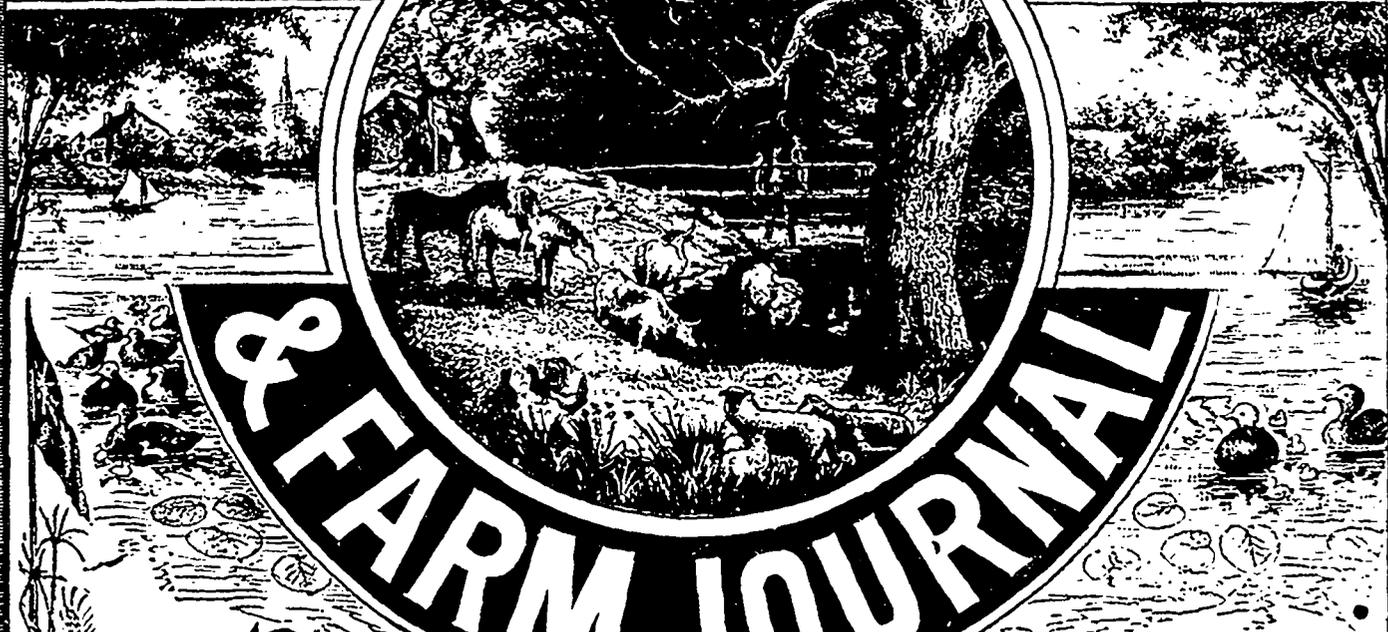


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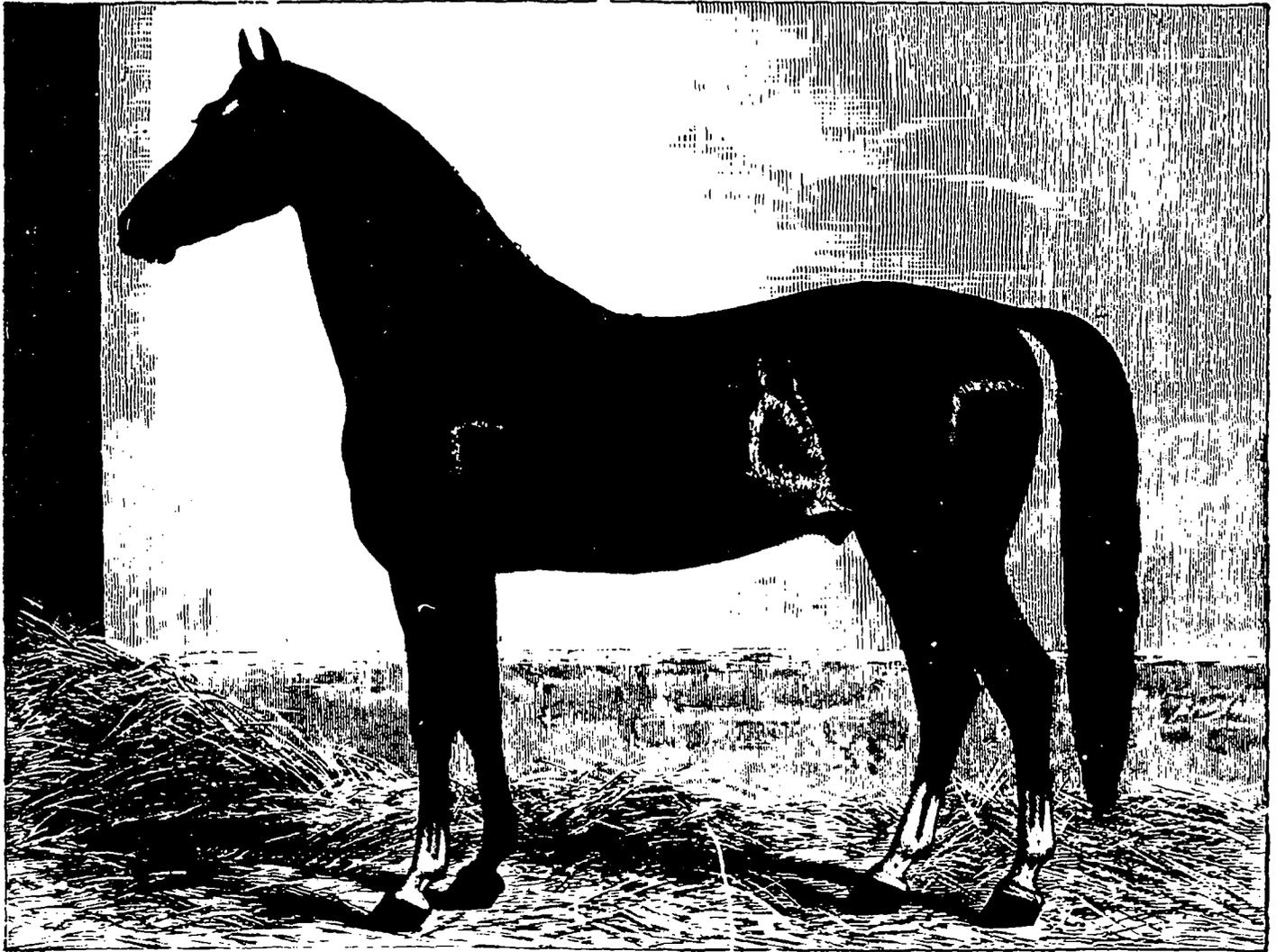
THE CANADIAN LIVE-STOCK AND FARM JOURNAL

DEVOTED TO THE INTERESTS OF THE STOCK-RAISERS AND FARMERS OF CANADA.

VOL. VI.

HAMILTON, CANADA, JUNE, 1889.

No. 68



THE STANDARD-BRED TROTTER FRANK ELLIS, 7397; RECORD, 2:26¼

Owned by J. Craig, V. S., Hamilton, Ont.

Frank Ellis 7397.

The uniting of speeding powers and proclivities with the other meritorious qualities of size and substance in the one sire is an achievement that calls into play the breeder's nicest discrimination, deepest thought and soundest judgment. Such is the happy blending of ancestral and personal qualities in Frank Ellis, the subject of the above engraving, for he is a horse of the richest lineage, standing over sixteen hands, and possessed of a record of 2:26¼ when an untimely accident, a slight fracture of a fore leg in a speeding contest, bounded the horizon of a sensational performer that gave strong indications of becoming a king of the turf; but it does not in the least impair his great value for stud purposes.

His head, delicately moulded and distinctly chiselled, with a pleasing eye and frank countenance, is carried gaily on a neck that for beauty and symmetry cannot be surpassed. It runs smoothly into an easy-playing though strong shoulder, that has behind it a body compact and well-rounded. His hind quarter is as level as that of a typical thoroughbred. and his muscles, fore and aft, are well worthy of being the levers of this excellent framework.

Prestige is given his individual merit by ancestral connections—the upper ten of horseflesh. He was sired by Happy Medium 400, the sire of the renowned stallion Maxy Cob, 2:13¼, and over thirty-five others in the 2:30 roll of honor. He also got the dams of DeBarry, 2:19½; Beaconsfield, 2:25½, and many other shining lights of the turf. Dutch Girl, the dam of Frank Ellis, was by Edwin Forrest 49 (Alexander's) sire of the dams of So So, 2:17¼; Mambrino Dudley, 2:19¼, and seven other members of the 2:30 group, while his sons have placed five among the same. Happy Medium was got by Rysdyk's Hambletonian 10, of world-wide celebrity as a thrower of valuable stock, he being looked upon as one of the great wellsprings of trotting blood, as he has forty of his get in the 2:30 list, including Dexter, 2:17¼, and Nettie, 2:18. The sons of this great sire have kept up the well-earned parental name, as the following list of his sons and some of their get will show: Harold, sire of Maud S., 2:08¼; Dictator, sire of Jay Eye Sec, 2:10; Phallas, 1:13¼, and Director, 2:17; Volunteer, sire of St. Julian, 2:11¼; Alexander's Abdallah, sire of Goldsmith Maid, 2:14, and finally the Great George Wilkes, founder of the Wilkes fam-

ily, including Harry Wilkes, 2:13½. The rest of his sons have placed over 30 inside of 2:20, and of his daughters over 50 of their progeny have records from 2:12 to 2:30. He is the grandsire of no less than 537 performers in the 2:30 list. Princess, the dam of Happy Medium, was a turf belle in her day, being a mare of great stamina, as attested to by the fact that she trotted to a wagon ten miles in 29:10¼, and repeated it again next day in 29:16¼. She was by Andrus' Hambletonian. The second dam of Frank Ellis was by a son of imported Trustee (thoroughbred), whose blood runs in the veins of many famous horses, remote crosses being found in Anteo 2:16¼; Hopeful, 2:14¼; Jerome Eddy, 2:16½, and a number of others.

A glance over these records makes prominent the fact that Frank Ellis possessing besides the personal attributes he does, is destined to make his mark as a thrower of good stock.

The subscription price of the JOURNAL is \$1.00 in advance, and \$1.25 when in arrears. No name will be removed from our subscription list when in arrears, until all arrearages are fully paid. The few readers yet in arrears will please notice the above. Our handsome picture of the Ontario Agricultural College, Guelph, is still sent to all subscribers paid to December, 1889.

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Remittances may be made in registered letter at our risk. The receipt of the JOURNAL will be sufficient evidence to subscribers that their remittances have been received.

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HAMILTON, CANADA, JUNE, 1889.

We have still a few copies left of that handsome lithograph of the Ontario Agricultural College. Subscribers now in arrears will please renew their subscriptions and thus secure one of them before the supply is exhausted.

A RECENT meeting of the Aberdeen Cattle Co. has exhumed the question of the advisability of encouraging our trade in store steers with the Aberdeen farmers. How such trade may prove profitable to Canadian stockmen, it is hard for us to understand, for in disposing of such animals, the best part of the farm's fertility is sold, and not added to as would be the case where ripened animals are produced. There is but little profit in finishing stores at the present stagnation prices we admit, but there is far less directly and indirectly in selling those but partly matured. The production of bone and muscle costs the farmer far more than that of fat, the latter being a gift of the atmosphere, through the crops that are grown and fed. However, we may be consoled with the fact that such a trade is better for the farmer and farm than that of absolute grain growing.

"Clothe an ape in tissue, and the beauty of the robe adds but the greater scorn of the beast," is a quotation that arises to mind as being very illustrative of the relation of the bull to the pedigree. A poor bull individually, with a pedigree of excellent merit, has but the deeper stigma upon him. Though such an animal may throw calves superior to himself, yet it is a rarity rather than a common occurrence. Many take delight in holding either up to ridicule, overlooking the fact that they are both necessary adjuncts to a good sire. As well say that the leaves of a tree are of more importance to it than the roots, as to place personal merit in opposition to ancestral excellence. The reason that pedigree is so strongly emphasized is due to the fact that it is so often overlooked and hence is more in want of champions than individual merit. As the scrub possesses neither of these qualities as a redeeming feature, it should be the butt of the united individual forces of those who place a high value on

individual merit, as well as those that are inclined to emphasize pedigree.

A NICE soft maple or a spreading elm in the corner of the pasture field conduces greatly to the comfort of the stock, and anything which does that gives direct returns in dollars and cents. These two varieties are perhaps the most valuable we have for such purposes, for when they are well established, they stand well the excessive tramping around their roots, and the rubbing of their stems by the stock. A small grove of such trees planted in the corners of four adjoining fields would be a lasting benefit gained by but little care, and the expense of but a small quantity of land. They would need to be fenced off, for stock do not dislike young leaves, and they are also pleased to get something to polish their horns on. The common scheme of building a lattice work around each tree would not fulfil the purpose, as this would give but little protection. The best way is to separate, by a fence, a small plot, and cultivate this for a few years, until the trees are well grown, when they may be given over to the stock without any misgivings, if the above mentioned varieties have been planted. Both these kinds have a preference for low damp spots, and in such situations, will best thrive. Shade and pure sweet water are valuable adjuncts to a good pasture, and every stockman should set a high value on their security.

THESE is a species of arithmetic at which the great mass of the farming community are not experts. Indeed, they seem to know nothing about it. We refer to that arithmetic which enables us approximately to come at the cost of what we grow, and hence the profit or loss resulting. Some will work away at wheat-production at 80 cents per bushel, when on the same farm butter might be produced that would sell on an average for from twenty to twenty-five cents per pound the year round. In such a case there need not be a shadow of doubt as to which of the two lines give the best returns. Then, again, some work away year after year during all the days and years in fact of their earthly pilgrimage, in keeping scrub cattle, for which they seldom or never realize more than three cents per pound live weight. Others, again, seldom sell for less than five cents. It is this haphazard way of doing things practiced by the majority that keeps down the profits of the farmers, at least this is one of the most potent causes of the slim returns which fall to the lot of the majority. If the merchant were to content himself with method; that were only half good he would not hold his own for a year in the fierce struggle for mercantile supremacy, and as one portion of the farming community becomes fully alive to the importance of adopting advanced methods, just in that proportion those who do not adopt them will fall behind in the race.

Constitution Not Developed by Exposure.

If asked to single out one feature that stands in bold and distinct relief above all others as a factor of worth in all domestic animals, we would, without the slightest hesitation and without the remotest fear of giving the question a controversial tinge, choose that of constitution. What the free-flowing springs of the mountain are to the voluminous river that flows through the lowlands, constitution is to the animal activities; it is the vital force that feeds the animal's tendencies, whether it be for the production of beef or milk, pork or mutton. As in the case of the stream, the force of the waters may be utilized to turn the milling stone, speed the clattering loom, or their forces may be wantonly spent; in the animal the

vital force may be either used to fill the milking pail, add to the weight of the body, or it may be wilfully wasted to combat adverse conditions as given in the decree that around the straw stack they must winter, or in the pasture they must want for water and resist the burning sun and the vindictive attacks of flies as best they may. To place animals under trying conditions seems to be a method, empirical it is beyond question, adopted by many to develop constitution. Colts are thoughtlessly, or more generally, lazily, allowed to withstand the winter's cold with only nature's protection, and fed scantily, that they may grow hardy; and the cows and the other animals of the farm come in for their share of this philosophy. These are left exposed to the rains without shelter, to the sun without cover, and are stinted with food to strengthen their constitution with the forlorn hope that they may get used to such conditions. So thought one of the most ardent followers of this sect (which we hope will soon become obsolete), when he, after conducting an experiment in which he succeeded in making his cow used to a few straws a day, bewailed the fact that the animal unfortunately died just as she was on the border land of living on nothing.

Some persons have defined constitution as the "ability to do well under adverse conditions." We only need to apply this to our breeds of the day and it becomes apparent that this is not a suitable definition. Put the Highland sheep that are used to the airy fastnesses of their native heath, on the rich fen bottom soils of the Lincoln, and it would not be long until they become subject to more diseases than the natives of this district, that have been reared to meet the conditions peculiar to their own section. Put the Cheviot in the pen from lambhood and the Leicester on the hilly ranges, and the former, according to this dogma, will soon show a weak constitution, though they possess constitutions, as known to all, that rivals if not surpasses that of any breed. Though the vigorous and healthy may best overcome hardships, yet it does not follow that the degree to which they can withstand conditions different from those under which they have grown, should be a test of their stamina or vital force.

Constitution is derivable from two sources—inheritance and acquirement. The former is the sum total of the ancestral possessions of this precious commodity, and it is the most valuable source of the two. It is the capital which, well looked after, constantly augments the reserve store. It is generally conceded that the transmission of this desirable feature is more dependent on the possessions in this respect of the dam rather than those of the sire. This is based on the physiological fact that the nurturing of the progeny falls to the lot of the dam. Some place much importance on the early influence of the dam on the foetus in its earliest stage, and as an external evidence of constitution, accept the size of the umbilical or navel. In the foetal condition this is the tube through which the developing embryo receives nourishment, and hence its size is taken to be an index as to whether the foetus has been well nurtured or not. To secure constitution from this source the signs of a vigorous body must be looked for both in sire as well as dam, whether breeding Shorthorns or Galloways, Thoroughbreds or Clydes. The bloom of the skin, the brightness of the eye, coupled with good heart and body-girth, are signs of a vigorous heart-pump that denotes activity of circulation and purity of blood. There is nothing stagnant in such an animal, the whole system being in thorough running order, whether at bodily rest or in action.

Quality and strength of constitution are not oppos-

ing features, as some would have us believe, and hence they both may be secured in the same animal. Such persons consider want of bone, thinness of skin, dearth of hair, and other like faults, to be indications of quality; but the true signs are close-textured bones, fineness of hair without scarcity, and cleanly chiselled extremities without coarseness, be it in the bovine or equine kind. The dam especially should be deep and roomy-bodied, giving free play to the organs of respiration and digestion, even when pregnant. In the latter condition the value of plenty of room for the reception of air to purify both the blood of the dam and foetus, and strong digestive organs to supply both cannot be too highly estimated.

The acquired constitution is such as obtained through the observance of healthy conditions of food and care. Here it is that the stock breeder may show his skill in augmenting the natural resources of his animals by clear-minded and intelligent practice applied to the tending of his herd or flocks. The surrounding of the animal with the most healthful conditions tend to strengthen constitution, though many put the opposite into practice in endeavoring to develop it. Pure water, nourishing food, cleanly quarters and good ventilation of stables, are important agents to increase the power of the vital forces. The English thoroughbred is a good illustration to show the influence of these factors on the constitution. Nursed in the lap of luxury from an equine standpoint and figuratively fed with a golden spoon, they, (though largely due to inheritance from their equally well cared for Arab ancestors), are the embodiment of all that a strong constitution can give, and possess that bottom and spirit that every horseman longingly looks for. All other breeds of horses, with rare exceptions, have gained their stamina largely through the Arab, and no other nationality observes so much kindness and attention to the comforts of their dumb comrades than these nomadic people. Then give way to later day teachings that the comfort of the animals in charge, whether in pasture or stable, cannot be too carefully looked after, and rest assured that in doing so you are not sapping their stamina, but building up their powers and directing them into profitable channels.

Stocking a Farm.

(Second Paper.)

There should be something more than an inclination to stock-keeping: there should be strong desire in regard to it, in which case there need be little fear but that success will follow, at least in measurable degree. The keeper of live-stock must love the work sufficiently well to enable him to give it ungrudgingly that closeness of attention without which best results can never be attained. The farmer who would be somewhat prodigal in his attentions to the wants of his stock is more excusable than he who might neglect it. Enthusiasm in any work is the pathway that pretty certainly leads to the pinnacle of achievement. It is a good indication when one meets a stockman who has the pedigrees of his favorites by heart; who, so far as his own flocks and herds are concerned, is a herd-book in himself. When you meet such a character you seldom find a man who has not made stock keeping a success.

When the class of stock-keeping is decided upon, then follows a duty which requires the exercise of much skill and great care if it is to be attended with success; we refer to the selection of the stock. If dairying is the line chosen, it is not absolutely necessary that all the animals should be pure-bred. For ordinary purposes it is better perhaps that they should not be, owing to a more limited amount of the first cost. It is not enough that the animals selected be

typical specimens of an ordinary good dairy cow, and abundant milkers. Here, too, pedigree must be examined if the dairyman is to breed the cows which are to replenish his herd. The ancestry of the cow must be examined, for if it has not come of long descent from good milking progenitors there is no certainty that she herself will breed milkers of the right types. A bull must then be selected from some of the recorded types to breed from; and here it is even more important to look into his lineage than into that of the cows, for if rightly bred and prepotent individually, his influence upon the milking properties of the future herd will be much more than the combined influence of the cows in that he is purely bred. The stockman who ignores pedigree may be likened unto a foolish breeder who built his hopes upon the sand. The rains of time descended and the winds of revolving years blew, and after long waiting he finds his expectations unrealized, for they were built upon the sand.

The fifty cent highway bull will no more suffice to meet the wants of the progressive stockman of Ontario. His era is fast drawing to a close. We have not reached the final close of the era of scrub sires in Canada, but surely we live in its latter days. We can fancy the advent of that period, which must be very near, when the teacher of the common school will rehearse to the boys of his class in agriculture, the infatuation of the men of a former generation in their persistent use of scrub sires, after it had been repeatedly demonstrated to them when they did so that it was to their own loss.

The man going out in a boat on a current of a river with but one oar, is about as wise as the patrons of scrub sires. That man must go downward, or at least he can't go upward. His movement is likely to be that of a succession of ellipses having a downward tendency. So must it be with the stockman who uses sires that are not the equal of his females where the effort is not made to lead in the line of improvement there must be retrogression.

If milk and beef are the objects sought, Shorthorn grade females of some good milking strain must lay the foundation of the herd. Here, too, the sire must be right in pedigree, more especially as regards the milking properties of his ancestry. The experience of the past has proved that for combined milking and beefing qualities no other breed will equal the Shorthorn, whatever may be the experience of the future. The calves, however, must be raised by hand, and all rational means used to retain and to improve the milking qualities of the cows.

If pure bred stock in any line is the object sought, too much regard cannot well be given to the nature of the foundation. A due regard must be had to pedigree, for pedigree is a grand thing, both in man and beast. But it is pedigree that must have other qualities than those of simple duration. It should be pedigree with excellence all along the line, otherwise prepotency may be attended with evil rather than good.

The price paid should be a moderate sum—we mean in a comparative sense—by all beginners who have not had large experience in the same or similar lines for long years previous. For the inexperienced to rush heedlessly into the breeding of pure-bred stock, paying fancy prices for the foundation animals, is folly of the most injudicious type. It may do for those who have large and well-established herds and a good and well-established market opened up, to pay a high price for a male of a certain type, but when the uninitiated do so they hazard more than they are aware of. They must hazard the contin-

gency of misfortunes, and lack of patronage from their neighbors. But their real difficulty commences when they are prepared to sell, for then they cannot realize anything like the proportionate prices paid. Nor should they complain because of this, for established reputation on the part of the breeder is worthy of its price quite as much as established reputation on the part of the physician. If a breeder by dint of perseverance and the exercise of skill brings himself to the front in the show-yards, he is justly entitled to reap the fruits of well-merited reward. If one desires to part with the ownership of a farm, he cannot take a much more direct way than to stock it with pure-breds purchased at fancy prices, and allow them to propagate their kind in a sort of aimless way and to go without a sufficiency of care.

(To be continued.)

The Worth of a Good Walker.

Thousands upon thousands of dollars have been spent to develop the speeding capacities of horses with the result that to-day the best strains of the trotter have this so strongly ingrained into their very being that they merit the appellation of a breed. Through cultivation this movement has advanced to a marvelous degree, and from this fact the growers of draught horses and others should take heart and by like attention develop the walking abilities of their charges. While we do not mean to lessen the value of trotting action in light and even heavy horses, yet we think that this feature has been too much lauded by our heavy draught breeders especially, and walking too much neglected. In connection with the latter class we venture the assertion that the fast walker will prove of more utility either before the city lorry or farm wagon than his inferior in this respect, but possessed of better trotting action. Walking is the pace of the farm and of all places where heavy loads have to be drawn. For the sake of illustration, suppose that one horse, a good walker, gains one foot every two seconds on his lazy comrade, which is not at all out of the way. At such a rate the good walker in a day of ten hours would go nearly four miles more than his sluggish rival. In a year of say 200 working days, where constant hauling is the work being done, this means a gain of 1,200 miles, or, taking the average of a horse's working life to be 10 years, a gain of 12,000 miles in that time. However convincing these figures may be, the value of a good walker is known to all, and it is to be deplored that while our exhibition associations spend dollars upon dollars, yes, thousands upon thousands of them to stimulate the breeding of the trotter, yet this feature, of far more utility to our farmers, is neglected.

The chief distinction between the walk and the other methods of moving is due to the fact that the hind leg takes the initiative as a rule, and as it is about to alight the fore leg on the same side leaves the ground. In the trot the fore leg and the opposite hind leg move together, while in the pace, or racking as it is usually called, the fore and hind legs on the same side move at the same time. In all forms the hind quarter is the great propelling power, shoving the body forward on the fore legs. The movement of the leg has been divided into three acts, lifting, swinging and grounding. In lifting, carrying forward, flexing, etc., of the fore leg, there are over twenty muscles brought into play, each performing its part in the movement, and in the hind leg nearly as many more have like functions to perform.

Stonehenge, writing on this question, is of the opinion that a good walker should take short, quick steps, with his hind legs well under him, and then,

as he says, he will be able to plant his fore feet firmly but lightly on the ground in succession. Continuing, he mentions that if the horse's stride is too long, his hind legs cannot be well under him, because they must be wide apart when both are on the ground, and the body then cannot be balanced securely because there is too long an interval elapsing while the hind leg is passing the other. Hence in such a horse there is a waddling movement from side to side, so often seen in the thoroughbreds. The clever hack, on the contrary, moves forward without his body deviating a hair's breadth from the line in which it is progressing, neither undulating to the left and right nor up and down. Many horses are under a disadvantage in walking, owing to the formation of the shoulder being such as to prevent them from stepping any distance. Depth of chest rather than breadth is more favorable for quick stepping, and the same may be said of the oblique shoulder. The advice of the recognized authority mentioned above is, in choosing a good walker, see that his feet are lifted smartly, that they are well thrust forward and placed lightly but firmly on the ground. Look at him well from behind and observe whether he hits himself on the fetlock joints as one foot passes the other, and at the same time examine whether as he lifts his fore feet he turns them out or dishes, which is a very serious fault in consequence of the loss of time it occasions. Many like to see the hind feet overstep the fore. The sweep of the hind legs is certainly a feature of importance, but it is more an objection than a desirable feature when carried to excess, for then the walk becomes a dragging movement instead of a quick, active one.

This quality, though dependent on the right conformation, may lie dormant even if the former is present, provided it is not cultivated. Early colthood is the time for the lessons to begin, either by leading or when mature enough, driving or working with an older animal possessing this valuable property to a great degree. We feel sure that were it given the attention its value merits, it would soon become a noticeable feature for the better in our many farm horses.

FOR THE CANADIAN LIVE-STOCK AND FARM JOURNAL.

Breeds of Pigs.

To attempt to give a history of the different breeds of pigs and their origin would entail a paper of much greater length than the space allotted would admit, besides perhaps imposing on the patience of the reader, many of them being mere local varieties and almost unknown outside of their own districts. It is proposed, therefore, to confine this paper to a few of the breeds already in the country, with a passing glance at some of the varieties from which they are descended. According to old traditions the British pig of the olden time was a large, coarse, ill-shapen animal; the size as well as the type varied to a considerable extent by the breed. Bewick, in his History of Quadrupeds, published in 1800, describes the common boar as "being of all other domestic quadrupeds the most filthy and impure. Its form is clumsy and disgusting." And certainly the woodcut, given in his work, of the boar of that period, fully justifies his description. About that period the attention of breeders was directed to the Chinese, Siamese and other foreign breeds of an improved kind, which possessed latter fattening propensities. A number of these were imported to England at different intervals, and crossed with different breeds of British pigs with considerable success, and it is extremely probable that there are few of the present improved breeds of pigs, but possess a dash of this foreign blood.

The Berkshire has for years occupied a front rank in the breeds of British pigs, and is evidently a strong favorite among the breeders of Canada, if the advertisements in the CANADIAN LIVE-STOCK JOURNAL are criterions. Little is known as to the origin and breeding of this well-known breed, and authorities differ considerably on the subject. Certain it is, if old pictures, engravings and descriptions are to be believed, the improved Berkshire of to-day, in his suit of black with white points, would never recognize his unimproved ancestor. R. Dickson, in his book of Live Stock, published in 1824, describes the improved Berkshire of his times as being in general of a tawny white, or reddish color, spotted with black, large ears hanging over the eyes, thick, close, well-made in body, legs short, small in the bone and having a disposition to fatten quickly: he describes the old unimproved breed as long and rather crooked snouted, large, heavy ears, body long and thick, but not very deep; legs short with much bone. Low, in his "Breeds of Domestic Animals of the British Isles," in 1842, describes the Berkshire as follows: "The color is sandy or reddish brown, spotted with black, the feet and legs for nearly their whole length white, slightly streaked on the sides and behind with reddish brown." Most authorities attribute their improvement to a cross with the Chinese and also with the Siamese boar. Mr. Heber Humphrey, the secretary of the British Berkshire Society, on the other hand denies any infusion of extraneous blood, and ascribes the improvement to careful selection, giving as evidence the fact, that in one district in the Vale of Berkshire, in the early part of the present century, the farmers who took a delight in their breeds of pigs, would often bet beforehand on the color that a litter would turn out when they were farrowed, or that one would pit the uniform marking of a litter against that of a neighbor, to be decided as soon as both were visible." He also says that the points of color, though desirable in those days, seemed to have been exactly in correspondence with our present markings. Writers who are regarded as standard authorities on all kinds of live-stock are almost unanimous in their testimony that the color of the old Berkshire was very different from that of the present breed, and it would almost seem in Mr. Humphrey's paper, that the "wish was father to the thought." However, whether the improvement is due to an extraneous cross or to careful selection, all readily admit the great merits of the Berkshire. Although there is a Berkshire Swine Book commenced in Canada there has not, so far as I am aware, been any scale of points adopted, so perhaps the following standard of the American Berkshire Association may not prove uninteresting:

- Color—Black, with white on feet, face, tip of tail, and occasional splash on the arm 4
- Face and Snout—Short; the former fine and well dished, and broad between the eyes 7
- Eye—Very clear, rather large, dark hazel and gray 2
- Ear—Generally almost erect, but sometimes inclined forward with advancing age; medium size; thin and soft 4
- Jowl—Full and heavy, running well back on neck 4
- Neck—Short and broad on top 4
- Hair—Fine and soft, medium thickness 3
- Skin—Smooth and pliable 4
- Shoulder—Thick and even, broad on top and deep through chest 7
- Back—Broad, short and straight; ribs well sprung, coupling close up to hips 8
- Sides—Deep and well let down; straight on bottom lines 6
- Flank—Well back and low down on leg, making nearly a straight line with lower part of side 5
- Loin—Full and wide 9
- Ham—Deep and thick, extending well up on back and showing thickness well down to hock 10
- Tail—Well set on back; tapering and not curled 2

- Legs—Short, straight and strong, set wide apart, with hoofs erect and capable of holding good weight 5
- Symmetry—Well proportioned throughout, depending largely on condition 6
- Condition—In good, healthy growing state, not over-fed 5
- Style—Attractive, spirited, indicative of thorough breeding and constitutional vigor 5

Perfection 100

The old Yorkshire, the ancestor of the imported large white, was one of the largest varieties; he had long legs, flat sides, narrow back, weak loins and large bones; the color was a dirty white spotted with black; hair short and wiry, mixed with bristles about the head and neck, and long ears. Some writers are of opinion that an improvement was effected in the old Yorkshire by a cross of the Berkshire, but it is difficult to credit that the old Yorkshire, itself rather inclined to a dark color, could have evolved by the use of the Berkshire, into a pure white pig; but by whatever means the alteration was effected, its descendants, the improved large white Yorkshire is a wonderfully superior animal to its ancestor, and has now taken the place of the Berkshire in the estimation of the bacon-curer, on account of the large amount of lean meat they produce in proportion to fat. There are three varieties of the improved Yorkshire, all white in color, the large, the middle, and the small. The fancy, in the improved large white is now for a shorter headed pig than in the old unimproved Yorkshire, but it must not be too short, as in that case the neck is liable to be too deep; they also have more hair, mature earlier and grow to a large size. The pair bred by Mr. F. Walker Jones (one of the most prominent and successful breeders) which won first and cup at Smithfield show in 1886, weighed 362 lbs. and 363 lbs. respectively at 9 months old, while Giantess, who won the champion cup for the heaviest pig at Birmingham show in the same year, weighed 852 lbs. They are good feeders and mothers, and are not only able to produce but also to raise large litters, an important item from the breeders' point of view. The following are the scale of points drawn up by Mr. Sanders Spencer, a well-known breeder of this variety:

- Head—Wide, deep, and of fair length; lower jaw sprung, ears neither drooping or pricked 10
- Neck—Muscular and rather long 5
- Shoulders—Wide, but not open; obliquely laid 10
- Fore legs—Straight, and placed well outside the body 7
- Ribs—Well sprung and deep 12
- Loin—Wide, not slack 8
- Flank—Deep and full 7
- Quarters—Long and straight from hip to setting on of tail 13
- Hind legs—Placed well on side, and not too much under the body 5
- Bone—Not coarse 6
- Hair—Long and silky, without mane or bristles along neck and shoulders 7

100

The small Yorkshire, as its name indicates, is a small variety originating from a cross with the Chinese. It somewhat resembles the white Suffolk in form, and like it, also, runs all to fat, and is consequently not desirable as a bacon-curer's pig. The middle Yorkshire originated from a cross between the large and the small varieties, and, as its name denotes, is a medium-sized pig; they are smaller than the large in bone and size, and much shorter in the face; they feed well, but the meat is not so lean or so firm as the large, and likewise there is a loss in the size and weight.

While on the subject of large pigs I cannot refrain from referring to a near relative of the Yorkshire, the

old Cheshire breed and the giants of the porcine race. They were remarkably long, stood very high on long, bony legs, heads large, ears long and hanging; backs much curved and narrow; sides flat and deep; their color was white, blue and white and black and white. Mr. Cully, in his "Observations on Live-stock," published in 1807, as an illustration of the gigantic proportions and astonishing weights to which this breed attains, says. "On Monday, 24th January, 1774, a pig (fed by Mr. Jos. Lawton, of Cheshire) measured from nose to end of tail 3 yards 8 inches, and in height 4 feet 5 inches; when alive it weighed 1,410 lbs., and when dead it weighed 1,215 lbs." The Cheshire pig having been crossed with other breeds as a pure breed is now practically extinct.

AGRICOLA.

Manitoba still Progressing.

(From our own correspondent.)

A month ago there were many promising indications to be noted here. The weather, since, has been of a kind to fully sustain the most sanguine of those indications. Ten days ago, after a hot gale from the south-west that made well up to 80° in the shade, we had rain enough in two nights to make up two inches. The last winter was a very dry one, and this splendid rain fall was just in time to save the states to the south of us from a short crop. Here we seldom expect rain till early in June, and though not so badly off as our neighbors, the only progress made by our grain crops was by the roots spreading underground as the effect of constant sunshine. It is this spreading of the roots, even when cold, dry winds keep down the early blade, that explains the rapid growth of our cereals after heat does set in. Last June up to the 9th, the show above ground was very slight, but showers and a spell of hot weather made an almost tropical growth for the next six weeks.

The early rain of this spring was followed by a spell of cold and dull weather, about the very best thing for us. Every green thing is practically about a month earlier now than at the same date last year, and with all that start we are safer to have only moderate heat for a week or two yet.

There is ample feed for stock, with a fair surplus of hay still on hand, and all have come through the winter in the best of condition.

This early seeding and early rain is sure to invite a large additional breaking of new land. There is in fact little work of any consequence to be done for two months, we raise so very little of green crop, and a good acreage of breaking can be done between this and haying. To the new men from Ontario this is a specially favorable year. They may begin to break now, and with the chances of a fair amount of rain-fall yet to come, they may be able to do an amount of breaking far beyond the possibilities of an ordinary season. I have known a man who never before put plow in a prairie sod, break, backset and harrow three times, 40 acres of land in a bad year with one yoke of oxen, and a pushing family from the east bent on making their mark here may be reckoned to beat that record by a long way.

If the early season is very favorable for the Eastern men who came early among us and bought, it has been just the reverse for the adventure men who came along with them on the chance of getting hired. Some such are always wanted, but farmers are not flush in offering tempting wages to strangers for assistance in doing what they have time enough to do for themselves. Thrift in keeping away from all unnecessary out goings is a leading point in farming administration now pretty well understood here, and

some farm hands that were shy of \$20 a month six weeks since would be glad to take \$15 to-day.

Old country immigrants who came later are pretty hard to place, especially if English. Some of these English are, if previously familiar with real work, hard to beat as workers, but the young men who come from comfortable homes to make money here, and can hardly be trusted to give a cow a drink, fare very badly indeed. The man will always get on best here whose skill, industry and perseverance form the biggest half of his capital. Capitalists who have only cash to invest get left nine times out of ten and sometimes very badly.

Another bright example of this good old English idea, that capital is sure to command success, may be seen in the recently floated big scheme of Sir John Lister Kaye out along the main line west. Not one man out of a score here has the least doubt as to the ultimate result of that scheme, the only point open to conjecture is, how long it will last.

Another venture of the same sort, started some years back with one large farm near Winnipeg and a big block more in the Qu'Appelle valley. They have just sold out the remnant of their stock and outfit after dropping a good pile of money over their venture. Of course the "blawsted country" will get all the blame and not the bumptious administrators. In this country "he that by the plow would thrive, himself must either hold or drive" and must at the same time know pretty well what he is driving at. Manitoba is not a paradise of fools, but for good half-section farmers I know of no better place. It is not at all difficult to find men who can raise 100 acres of grain with half-a-dollar an acre laid out for hired help.

In stock raising, fair profits have been made by men who sold at the right time. At Easter four cents a pound live weight was made for good cattle—not a bad return for all the work we spend on them.

We are starting at least three new creameries in the north-west of this province just now, but we are very poorly organized for successful dairying—one man here and another there going in for the venture and the rest staying out. From this way of working a dairy district, very little profit or pleasure can come, and instead of blaming their administration, everybody blames everybody else, and there is a "bust-up" of the combination. We can and must do better than this. In some cases we are doing better already, but it is folly to paint everything *couleur de rose* here. Just now I think that well managed home dairying is a big thing in the right hands.

I have lying beside me, as I write, the year's record of a small private dairy, of Shorthorn and Ayrshire grades, run by a farmer not a dozen miles from Winnipeg, who sold his butter by private trade, direct to families in the city. He does not pretend to make something out of nothing. He fed well, and cared properly; handled his milk tastefully; and sold in the very best market. From a note carefully made of every cow's yield for one day in the week, I find two cows, 6 and 9 years old, with 8,600 lbs. milk each; three cows with average of 7,100 lbs.; and a heifer with 6,000 lbs. to her credit. The butter made from this milk he sold at 20c. in mid-summer; at 25c. in September and October; and at 30c. for six winter months. This I think a proof that winter dairying is possible, and very profitable here. Twelve out of eighteen cows were in milk in the dead of winter, and I have another record for a month of an Ayrshire cow, that in January last made over 900 lbs. milk, and paid her way very well at that figure.

The innocents who know just how the shoe pinches them here, and fly off as far west as they can get for salt water, to better themselves, keep always on the move—some going out, some coming back, with a very pitiful tale of their experiences. Sick, friendless, with no prospect of employment, they wander round till their friends contrive to bring them back here, or to the North-western States, from which they came by way of Winnipeg. It is not because I am a Manitoban, that I counsel emigrants to the West coast to look well before they take such a very long leap. I invite intending emigrants from Ontario to take an excursion ticket here in July. If the country don't seem to suit you after a week's ride through it, by all means stay at home, or try elsewhere.

An interesting experiment is now being tried by General Superintendent Whyte of the C. P. R. Blue grass is found to grow greenest in the fall, just when all other grasses are dry and ready to blaze from the slightest spark. Mr. Whyte has distributed over 2,500 lbs. of blue grass seed, to be sown by farmers on their own land alongside the track, so as to form a green fire-guard, in which the sparks from passing engines will not kindle. As permanent pasture is a great desideratum here, this may prove of great value to the country, for once taken hold, blue grass will spread everywhere. The only trouble is that owing to the softness of the seed, it is very difficult to keep it from getting more or less musty in store, by which much of its vitality is lost. It is certain that blue grass has covered great areas further south, and is doing the same here, wherever it has got a foothold.

Bright Prospects for Nova Scotia.

EDITOR CANADIAN LIVE-STOCK AND FARM JOURNAL.

Your readers are all interested in each other's condition and circumstances, and I have no doubt that your friends in the West are as desirous of hearing, once in a while, from us in the East, as we in the East look forward to similar interchanges from them. Never have we had such an early spring here, and such balmy weather at this time of the year; we are at least a month earlier than usual, with finer growing weather than I have seen sometimes in the middle of June, and then the ground is in such good condition. In fact, never had the farmer such cause to rejoice at the prospects of so promising a season. Active farmers are rapidly getting their seed in the ground, and are encouraged greatly by the continued fine weather. Merchants are also busy opening up new goods, and anticipate a big season's trade, if one may judge by the size of the importations. Not only are the prospects unusually encouraging for the farmer and merchant, but in our factories also a bright activity prevails. In the steel and forge works extra help had to be taken on, both on the day and night shifts, in order to make satisfactory progress with the work on hand. In the smaller factories we hear the same story of plenty work to do. And then again we expect our "iron mines" to be opened up this summer. Unless some very big lies are floating in the air, a company, composed of Americans and Nova Scotians, have already located a line, and according to report, will immediately proceed to build a railway from the iron ore deposits to connect with existing lines of railway. The opening up of our iron mines is a matter that has been "talked about" for a number of years, but now it looks like if the talking has all been done, and the work actually begun.

Each year as it passes marks an advancement or retrogradation in every country in the world. "If this is so, and men say truly," we can much more readily assert the fact that in every kind of business, if one will only take the trouble to look into it, a perceptible movement is going on, which will have a tendency to either make or break that particular business in the end. It is a matter of fact, and cannot be disputed, that changes are constantly taking place in the ways and forms of doing business, and it behooves every one, no matter what business he is engaged in, to be watchful and ready to take advantage of any improvements that will present themselves. Take the farm for instance. A farmer who is active, energetic

and interested in his work, will have round about him unmistakable signs of his thriftiness that the most indifferent passer-by will not fail to notice. His fields are covered with a rich growth; his stock will be found in a thriving condition; his barns, outhouses, and farm machinery, tidy and neat; in fact, his surroundings, so attractive, that we willingly stop on our journey past to admire them. He may be a poor man, that has very little ready cash, but he is interested in his work, which counts for a great deal. A little attention and a very little money spent goes a long way on or about a farm. As a general thing, a farmer will consider well before spending money on anything new—that is, on any new kind of machinery or a breed of cattle that he has not had personal experience with himself. Caution in spending money, of course, is advisable under all circumstances, but how often we notice it is "penny wise and pound foolish" with a great many.

In our own county here, notwithstanding a slowness and apparent unwillingness among our farmers to improve their stock, and increase their facilities for carrying on farming operations, a noticeable change for the better has taken place in the last few years, which is steadily increasing, and I venture to assert, will make rapid strides in the next few years. I have travelled around a bit, and in no place have I seen a man make as easy a living at farming as they do in Nova Scotia, and there is no reason why money cannot be made, if you operate your farm on business principles.

Close to the town of New Glasgow we have a number of enterprising farmers, men who were not afraid to invest their capital in the business, and who have met with evident success. Such men as: A. C. Bell, "Coldstream Farm;" John Cameron, "Prospect Hill Farm;" John McDonald, "Plainfields;" James McKay, "Rose Cottage;" John Ross, "Prospect Farm;" H. J. Townsend, "Brookside Farm." On the farms owned by these gentlemen can be seen pure-bred Durhams, Holstein-Friesians, Ayrshires, Jerseys; pure-bred Clydesdale stallions, Standard-bred Trotting stallions, and well-bred mares.

I may just say in conclusion that New Glasgow is a prettily situated town, with three first-class hotels, viz., the Vendome, which is situated close to the I. C. R. station; the Windsor, built on the bank of the river, a beautiful situation, and the Norfolk House, on the principal business street. Its citizens are always ready to welcome strangers, and if any of your breeders living in the West should happen down this way we would advise them to stop off at this station, make themselves known, and I guarantee they will be well received.

New Glasgow, N. S., May 9th, 1889.

The Battle of the Breeds.

EDITOR CANADIAN LIVE-STOCK AND FARM JOURNAL.

SIR,—Over the signature of one Stephen Nicholson, Esq., of Sylvan, "Shorthorns as milkers," we are treated to a breed 's experience. It appears to me that Mr. N. is not very well posted in dairy cows. He speaks of his own cow Leaneore 2d, when fed well, yielding in seven days the large amount of 9 lbs. 5 oz. of butter. He also speaks of her taking 1st prizes last fall at the local shows. Surely, Mr. Editor, it could not have been for her excellent butter qualities. If he had waited until the April number of the JOURNAL had appeared he scarcely would have sent his article to the press. We see there Holsteins have been bred for over 2,000 years in absolute purity, and with the one aim of fitting them for dairy purposes. I would also invite his attention particularly to the essay of H. Bollert, Cassel, Ont., where two-year-old heifers have produced from 12,000 to 14,000 lbs. in one year; and even as high as 18,000 lbs., more mature cows giving from 60 to 70 lbs., 90, 95, 112, up to 116 lbs. for a single day.

Now for butter, which Mr. Nicholson mentions specially in his letter. Messrs. Smith, Powell & Lamb give a record of 100 cows in their herd averaging 18½ lbs. of butter in one week. Netherland Princess 4th as a two-year-old with a record of 21 lbs. 8 oz.; another of 105 lbs. in 20 days, 304 lbs. in 90 days, and so on up to 32 lbs. in seven days.

The Holstein Friesian Association has an advanced register where no cow is allowed to enter unless she has made over 15 lbs. of butter in one week, and one of the States is preparing a register with the line drawn at 20 lbs. per week. Compare these figures

with those of Mr. S. N., and his statements sink into oblivion.

He seems to have a particular antipathy against breeders of dairy cattle of other breeds. I am glad that the Ontario farmers have minds of their own; and as this country is becoming more a cheese and butter country, it behooves the dairymen to select the best kind of cattle to meet this ever-increasing demand for his product in the English market.

The Holsteins at the Michigan Agricultural College lately gave the greatest result from the same amount of feed of any of the various animals at the Fat Stock Show, having taken 7.67 lbs. of grain and hay to make 1 lb. of beef on a Holstein and 10.15 lbs. to put 1 lb. of beef on a Shorthorn.

But the Shorthorns, Mr. Editor, have been and are good beefers; but let Mr. Nicholson allow men the privilege of introducing the cattle they think best; it is a large country; there is room for all without any strife. In conclusion, I will ask your many readers to draw a comparison and then decide for themselves.

Birnam P. O., Ont.

S. D. BARNES.

Feeding and Marketing Hogs.

EDITOR CANADIAN LIVE-STOCK AND FARM JOURNAL.

SIR,—We are pleased to know that our former article on hogs met your approval, and are glad to say that our firm has received many letters from farmers expressing the determination to go into swine-raising more extensively, and before entering on the topics we promised in our last to write about, we should like to say that we only obtained 80 hogs last week and many of these very unsuitable, mere shoats. The present market price is 5¼c. to 5½c. live weight in Toronto, and the demand from Montreal and Ottawa urgent. We would ask, what can farmers raise to pay so well? Then think of the value of the manure, and how cheaply they can be brought up to 75 or 100 lbs. weight. A large farmer west of Stratford paid us a visit by appointment recently, to talk about hogs, and he said that we might have truthfully said that a good brood sow would be more profitable than two ordinary cows. And this man shows his faith by his works, for he built two years ago a pig pen of brick, with hollow walls, frost proof, costing \$1,500, where he feeds 200 or 300 at a time.

I should like to say a word or two about breeding. I find that many have an idea that to make a success of hog-raising and feeding they must be pure-bred. This is a mistake, and my advice to the ordinary farmer is to get a big, strong, and long sow, and breed her to a pure-bred, and for all practical purposes her progeny will be as good and perhaps better for feeding than the real simon pure.

And now for the promised opinions on feeding and marketing:

1. Feeding, and we include in this general care and housing, and the last two are of as great importance as the first.

One of the best feeders of live-stock said to us, "If you want a critter to thrive, you must make it comfortable." This is so self-evident a proposition that we need not attempt to prove it. But what do we find in the larger part of the pig-pens—the creatures lying in their own ordure and the pens only cleaned out every few weeks or months; then pen itself open to all the winds of heaven. And then many of these farmers say it is all nonsense feeding hogs, "I have tried it, and it does not pay." Then they are fed irregularly, like Paddy's pig, to make streaky bacon, fed one day and starved the next, so as to have a streak of lean and a streak of fat. Unfortunately the class we have described do not subscribe for farm papers; they don't believe in book-farming, and besides, they can't afford it, though we have noticed they can afford to go to "hoss trots" and smoke cigars, and often drink whiskey.

Regarding feeding, we would say, keep the young pigs thriving and growing on skim-milk and buttermilk, with shorts and bran, and in winter clover hay, cut up and steeped in hot water, and in summer green clover; and when they are four months' old and weighing about 75 lbs. then shut them up and feed them a mixture of boiled potatoes, and barley, oat and pea-meal. By this means you will have prime hogs at six to eight months old, weighing 140 to 175, or even 200 lbs. alive.

To clinch this nail we must again quote a "wise saw" from our old friend referred to above: "If it does not pay to feed, it does not pay to starve," and it has been proved by frequent and careful experiment that pigs lay on more flesh for the food fed at the ages

named above than older, and by this plan the farmer can have quick return, and all business men know the nimble ninpence is better than the slow shilling.

2. Marketing.—From the experience of thirty years, acquired in the pork-packing business, if we were fattening hogs for sale, we should aim to have them ready in two lots, from first to middle of April and again in August or September. The average farmer has all his live-stock, poultry, mutton, pigs and a few cattle that he calls fat, but really stockers all for sale at once, and when every one else has, consequently he has to take the lowest price; but the shrewd, keen, observant yeoman knows better another illustration of the inspired proverb, "The prudent forsooth the evil and hideth himself, but the simple pass on and are punished." So much for time of marketing, and now for the mode. Except in very exceptional circumstances, it will always be best for the farmer to market his hogs alive. The reasons for this are obvious. In the first place everything goes and realizes something, whereas where killed on the farm a large part of the inwards is totally lost. In a well appointed packing house nothing is wasted, and it may surprise many to be informed that our average profits per hog do not exceed the value of what is usually buried or burned where hogs are dressed on the farm. It therefore follows that in the long run the farmer will do better not to kill his hogs, but to sell them to drovers, whose name is legion; or where the number he has to dispose of warrant it, to deal direct with a respectable pork-packer, of which there are several in Ontario. Where this is not practicable it may often be made so by two or three neighbors joining their forces and chartering a car between them. Generally speaking the number of hands through which a dressed hog passes between the farmer and manufacturer is much greater than when live hogs are dealt with, and as each dealer requires a profit, it follows that the farmer having hogs to sell can generally realize most by disposing of his hogs on their feet.

In the Western States, the greatest hog-producing country in the world, and where the business is better understood in many respects than anywhere else, such a thing as dressing hogs on the farm is never dreamed of. We know prejudice is strong, and time will be needed to overcome it, but we have no hesitation in saying that the absurd habit of marketing hogs dressed is of itself, unless corrected, sufficient to retard this branch of Canadian industry, so that it will never rank where it ought to, and where it must if Ontario farms and farmers are to take their proper place among agricultural communities.

It stands to reason that the cured product of hogs dressed on the farm, and for the next month or six weeks knocked from pillar to post, and alternately frozen and thawed, cannot be equal in any respect to that which is produced from hogs killed, cut and cured in an establishment where every necessary or desirable device is at hand, and where the whole operation takes less time than it takes dressed hogs generally to pass from the farmer to the packer. The natural result in the latter case is that the improved quality of the product induces consumption, and this redounds to the benefit of all concerned, from the man who grows the pigs to the man who cuts up the product on his counter. So convinced are we of the truth of the assertion we have made, that for years we have set our faces against buying anything but live hogs, and the result is we handle more than any house in Canada, and our product stands without a rival, either in this country or in England, where four-fifths of it finds a market.

With your permission we will continue to ventilate this subject, and hope in our next to have something to say about the hog in Sweden, Denmark, and perhaps Ireland.

Toronto, Ont.

WM. DAVIS & CO.

Preventing Conception.

EDITOR CANADIAN LIVE-STOCK AND FARM JOURNAL.

Kindly answer the following query and you will greatly oblige the undersigned. I have a heifer that I did not wish to get in calf for some months yet, but the other morning, when I turned my stock out of the stable, the bull served her before I knew that she was in heat. What could I have done after she was served to prevent her getting in calf?

ANSWER BY F. C. GRENSIDE, V. S., GUELPH, ONT.

If the heifer had been well syringed out with luke warm water, the chances are she would not have conceived.

The Guernsey Cattle.

Confined within the sea-bound limits of a small island, the area of which is only 24 square miles, the Guernseys have been bred for over a century in absolute purity, and the indications of judicious selection and watchful care and attention, though pent up within these constrained limits, are clearly apparent in the robustness of frame and constitutional vigor that has given them a preference in the minds of many over their Jersey competitors. Just about a century ago the insular legislature passed a law forbidding importations of any cow, heifer or bull calf under a penalty of 200 livres, and the forfeiture of all the outfit, and an additional penalty of 50 livres on any sailor on board who should fail to inform of the importation. Previous to the passage of this law, and even at a later date, the breeds of the Channel Islands were grouped together as Alderneys; but now, through the action of the authorities on the other islands, as well as owing slightly to a difference in selection, there are three distinct breeds of three separate types. The Jersey was bred a shade finer than the Guernsey, and an eye was also had for appearance and the possibility of a market for the deer-like beauties to embellish the greensward of the parks of the English gentleman was not overlooked.

Low, in his book on Domestic Animals, published in 1841, groups the three under the name Alderney, and gives an engraving representing this breed, which the Guernsey patrons claim is a faithful representation of the modern Guernsey, and they cite this as an indication of their fixity of type, which is further shown in the potency of the bulls in imparting their qualities to graded offspring.

The origin of the Guernsey is wrapt in mystery to a certain extent, some affirming that they were brought to the island by the Scandinavians, and others claim that they came from the neighboring coast of Normandy. On the island they have been bred for years, and the great desideratum kept in view both in breeding and care, was the evolving of a cow possessed of the strong powers for the production of butter. Nearly the whole of the milk produced by the island is made into butter, which, owing to its golden color and fine quality, brings a high price in the markets of Great Britain.

The first feature of a typical Guernsey to attract the attention of the examiner is the rich golden color of the skin, as pliant as a glove, and so unctious that you feel you could squeeze the butter out of the pores of the skin, clearly showing that the breeding and attention to butter qualities has not been in vain. In general form the Guernsey is stronger built and more vigorous than the Jersey, possessing more bone and size. Matured cows weigh as a rule from 1000 to 1400 lbs., and some of the bulls will tip the beam at 2000 lbs. A good cow of this kind is deep bodied, with a capacious udder running well forward and strongly attached, and good sized teats, and her clear, contented eye, her placid countenance in conjunction with her docile disposition, indicates that she is perfectly satisfied with her office in life—a special butter machine.

The following is the scale of points adopted by the American Guernsey Cattle Club, which will give some idea of the type they desire to establish:

Quantity and Duration of flow.	Escutcheon wide on thighs, high and broad, with thigh ovals.	10
	Milk veins long and prominent.	6
	Udder full in front.	6
	Udder full and well up behind.	8
	Udder large, but not fleshy.	4
	Udder teats squarely placed.	4
	Udder teats of good size.	2
		40

Quality of Milk.	Skin deep yellow in ear, on end of bone of tail, at base of horn, on udder, teats and body generally.	10
	Skin loose, mellow, with soft fine hair.	30
Size and Substance.	Size for the breed.	5
	Not too light bone.	1
	Barrel round, and deep flank.	4
	Hips not loins wide.	2
	Rump long and broad.	2
	Thighs and withers thin.	7
Symmetry.	Back level to setting on of tail.	3
	Throat clean with small dewlap.	1
	Legs not too long with hocks well apart in walking.	2
	Tail long and thin.	1
	Horns curved and not coarse.	2
	Head rather long and fine, with quiet and gentle expression.	3
	General appearance.	2
		14

For heifers deduct 20 counts for udder.

From the above it will be seen that great stress is laid on the butter and milking indications, for no less than seventy out of the hundred points are given for these traits.

The Guernsey advocate looks more for averages than phenomenal results from individuals, and hence the reason that we hear so little of them, while the great performers are being paraded. At their native home an average Guernsey is expected to give a Guernsey pound (18 ounces) a day per year of marketable butter, tethered in the pastures with little or no grain.

The herd of Mr. J. DeGaris, Rouvets, Guernsey, consisting of 5 head, averaged per head 252 lbs. of commercial butter, and 4 quarts of milk was used by the family. That of Rev. W. A. Glynn, of Isle of Wight, who has been breeding Guernseys for twenty years, and has about 30 or 40 head, averaged 650 gallons of milk per year, and some went as high as 900 gallons of butter to 2 gallons. Individual records ranging from 15 to 20 lbs. per week are not by any means rare, and this has been sustained in many cases for lengthy periods. The averages of five years tests of the various breeds exhibited at the dairy shows of the British Dairy Farmers' Association may not prove uninteresting and it certainly speaks volumes for the quality of their milk. The following are the results:

	Per cent. butter fat.	Total solids.
Guernseys.	4.80	14.09
Jerseys.	4.26	13.6
Shorthorns.	3.79	12.7
Dutch.	2.97	11.8

A recent test conducted by the English Guernsey Cattle Society was made with the cow Luke de Richmond 683. Every precaution was taken to make the results reliable, thus leaving no doubt as to the validness of the outcome. In three days she gave 104½ lbs. of milk, which analysis showed to contain 5.01 per cent. fat, and 14.3 per cent. total solids, from which gave 6 lbs. ½ oz. of butter, or equal to 14 lbs. ½ oz. butter per week. The conditions were unfavorable, the weather being bad, and she had calved five months before the test. During 1887 this cow yielded 3,646 quarts, and in October, 1888, five months after calving, she gave 449 quarts.

They have an equally good record in America, and tests from 14 to 20 lbs. per week are not infrequent. Lucille 115 has tested at the rate of 21 lbs. per week, though not for seven consecutive days. Polly of Fernwood tested 19 lbs. 4 oz. in a week, and Hazel 1225, 16 lbs. 14 oz. on grass alone per week.

As far as we are aware there is not a single animal of this breed in Canada, their scarcity and resultant high prices acting as a damper on their progress. With increasing interest in the dairy industry and particularly in the butter production, they may captivate a Canadian patron, and will surely fit into some niche of our vast Dominion.

Judges for Exhibitions.

EDITOR CANADIAN LIVE-STOCK AND FARM JOURNAL.

SIR,—I see that Mr. McCrae has undertaken to answer my last letter. In the first place he accuses me of using a *nom de plume*, so that I can state propositions that I do not believe. Would it not be just as easy to do so over my proper signature? I think any sensible man would say it would. He looks upon it as a great crime for any one to do so. Did not some of the greatest authors that ever wrote in the English language do so—such as Dr. S. Johnson, Joseph Addison, Sir Walter Scott, Charles Dickens, and a host of others?—and they were never accused of doing so, that they might state propositions they did not believe. The fact was they had strictly honorable reasons for so doing, and so have I. Enough for him to know that I have a name, a name that I am in no way ashamed of. He then goes on to heap fulsome compliments on his protegee, and I have no doubt but that when he (the protegee) reads his communications he will be very proud of his doughty defender.

He then states that I seem to be afraid of his protegee. In the ordinary sense of the term I am not the least afraid of him. So much for the first paragraph of his letter. In the remaining portion there is only one thing worthy of notice, and that is this. He says: "After this 'Brevis' seems to get mixed, for he says there will be over 100 exhibitors, and then he seems to think that it will be necessary to have 100 judges for these exhibitors." He then sneeringly remarks, "Did you ever hear such stuff?" It is but fair to myself to say this was a printer's mistake. It should have read (and did in the manuscript), "In the Dominion there will be over 1,000 exhibitors, and if the D. S. B. A. were to appoint judges for all these it would have a herculean task that would be worthy of it. The error was so palpable that if your correspondent had been a little more generous in his mind he would have treated it as such. Other than this the remaining portion of his letter is a perfect riddle—I cannot in the least see the drift of it; it is simply a literary conglomeration.

But this is not the question. The important question is the best mode of appointing judges for our agricultural exhibitions. And now, friend McCrae, lay aside all personalities, and let us reason together.

In the first place understand that I am not accusing any of the members of the different associations or boards of which we may hereafter speak, of acting dishonorably, for I have no doubt but that "they are all honorable men;" but we must remember that man is a fallen being, and there is none that are above reproach, and the one being that is the most uppermost in the mind of all is self; and if it is in his power to manipulate circumstances for his own benefit he will certainly do so. And speaking after the manner of men, who can blame them? But is it not a dangerous thing to place this power in the hands of men when it can be used for their own benefit and to the disadvantage of others?

Let us look for a moment at the composition of the executive of the D. S. B. A., and the list of judges they have nominated; also some of the managing boards of our exhibitions, how one person will hold a position on several of them until a solid and powerful coterie is formed composed of a few leading exhibitors, a few prominent members of the D. T. H. B. A. executive, and also a few from the managing exhibition boards. Now, to be told that an exhibitor unknown to fame, or one who exhibits only one or two animals, will have an equal chance with the members of this powerful clique, is just too funny for anything.

For instance, we find that the president of the D. S. H. B. A. is also a member of the committee on cattle at the Toronto Industrial, and as he is there to look after the Shorthorn interests, I infer that it will rest almost solely with him who will be the judges in that class. (I might state here, Mr. McCrae, that surrounded as your ward is by the prestige of office, and entrenched in this almost impregnable position, if I was so unfortunate as to show against him I should have just cause to be afraid of him.) Now I don't wish it to be understood that he would use this immense power that is placed at his disposal, but it is a radically wrong system that puts this power into the hands of an interested individual.

Another of those who have been nominated as competent for judge is a member of the Agricultural and Arts Association. He is also a very prominent member of the D. S. H. B. A. executive. He is also an extensive dealer in Shorthorns and deeply interested

in the success of certain families of Shorthorns, a great many of which have passed through his hands into the hands of exhibitors, which makes him an interested party, which should disqualify him from the office of judge. Indeed, there are as many as half a dozen of jobbers nominated as judges whose names should have never been there. And so we might enlarge ad-infinitum, but want of space forbids.

It is a most degrading commentary on the farmers and stock-breeders of our country that this little more than a dozen should fill nearly all the positions on three or four different boards, when in the interests of justice it is imperative that these boards should be independent one of another; but such is not the case, they so multiform and mix that they fuse into a powerful ring.

And now, friend McCrae, lay aside your imaginary scruples about answering arguments and facts simply because they appear over a *nom de plume*. The name cannot affect the question in the least. Cease to pour the vials of your burning sarcasm on the head of poor "Brevis" and treat the question calmly and logically and I will give your arguments due weight, for I am open to conviction. The more light we get on the subject the better, so do not hide your light under a bushel simply because I won't word my letters just to suit you. But remember you did not attempt to answer a single argument in my last communication. For one thing, however, I desire to give you credit; your confession that you know from experience that prizes have been won by unfair means. I don't say it was not wrong of you to say so, but the confession atones for nearly all the guilt.

You accuse me of lacking brains. I readily admit it, and the knowledge of it gives me as much pain as it appears to give you pleasure. But I took your intellectual measure from your letter, and I am not afraid to meet you when logic and reason are the weapons.

STEPHEN NICHOLSON,
alias "BREVIS."

Sylvan, Ont.

Pig-Breeding Crate.

EDITOR CANADIAN LIVE-STOCK AND FARM JOURNAL.

SIR,—In the April number of the JOURNAL in article on "Swine—Their Breeding and Management," mention is made of a breeding crate to keep a large portion of the weight of heavy boars off the sows. I have recently bought an improved Ohio Chester White boar, and he promises to be very large and heavy. Could you or some of your subscribers through your columns give me an idea of the construction of such crate, as such a thing is unknown in this neighborhood, and would be of much use?

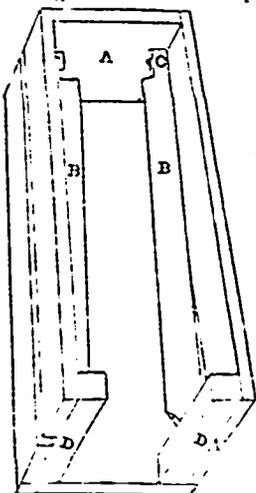
I find the JOURNAL of great benefit, giving many good ideas that may be put into every day use on the farm, and of particular benefit to one just starting Shorthorn breeding.

Moorefield, Ont.

THOS. J. PATERSON.

A breeding-crate can be easily and cheaply made. One of the best that has come under my observation was made out of an ordinary pig-crate of 3/4 inch stuff, the length and height of course being regulated according to the size of the pigs.

The following are the dimensions of a Berkshire breeding-crate: 2 feet 9 inches high, 5 feet long, 2 feet wide. At the front end of the crate (A in fig.), 21 inches from the floor and close to each side of the crate, a hole two inches square is made, to admit the ends of the scantlings which are to carry the weight of the boar. At the back end of the crate, which is of course left open, an upright (bored with augur holes at different intervals) is nailed at each side of the crate (see D in fig.), the holes in the uprights facing to the before-mentioned square holes in the front of the crate. Then take two scantlings (B in fig.) about 2 by 4, and about 5 feet 6 inches long, and cut a tenon



2 inches square at the end of each, so as to fit easily in the holes at the front of the crate, the other end of each scantling being cut down to fit into the augur-holes in the uprights at the back of the crate. Care must be taken that the tenons and the rounded ends are cut so that the scantling will lie close to the sides of the crate, in order that the foot of the boar may not slip down between. The square tenons must also be cut sufficiently far back to admit of the scantlings being pushed forward so as to be able to fit the rounded ends in any of the holes in the uprights at the back of the crate, in order to obtain any desired height. It will be understood that when the scantlings are in position the feet of the boar rest on the 4 inch wide surface of the scantling; the sow standing between the two scantling, while the square holes in the front prevent the scantling from twisting over. If the sow be large and the boar small, a platform should be placed behind the crate of any desired height; this may be formed of an old door or a few boards. And vice versa if the sow be small and the boar large, the platform can be removed, and if this is not sufficient the crate can be blocked up.

AGRICOLA.

The Victoria Swine.

This new and beautiful breed of white pigs is coming rapidly into favor. It was originated by Mr. Geo. F. Davis, of Dyer, Lake Co., Indiana, and is the result of crossing four distinct breeds, viz, the Poland China, Chester White, Berkshire and Suffolk. The breed first made its appearance in the show-rings in 1878, when Mr. Davis exhibited at the county fairs in Indiana and Illinois, and also at the Chicago fat stock show.

In 1881 Mr. Davis was awarded the grand special prize of \$125 for the best five hogs in the show, any age or breed, and the following year were classed by the directors as a distinct breed.

Since that date their increase has been very rapid, and they are now numerously represented in Iowa, Minnesota and other States of the West. About the year 1886 the Victoria Swine Breeders' Association was organized, and the first volume of the "Record" was published in 1887, containing pedigrees from 1 to 103.

The originators of this breed have acted very wisely in organizing thus early and in preserving the necessary records from the first. Because of this no cloud of obscurity shall ever hang over the early history of the breed, such as bedims the early history of all the older established breeds of live stock, and from the darkness of which the eye of research must turn away in the vain endeavor to find light where it does not exist.

Mr. Davis, the chief originator of the breed, who is also president of the association, of which H. H. Davis, of the same place, is secretary, is evidently a skilful breeder and possessed of that energy and persistent perseverance which is sure to leave posterity a legacy of more or less value. We think, however, that if in the introduction to the first volume of the record the author had dwelt at greater length on the distinctive peculiarities of the breed, he would have done the same good service.

These are, so far as narrated, the possession of a fine symmetrical form, covered with a good coat of fine, soft hair, with bone fine and firmly set. They are easy to keep in condition, fatten readily at any age, and produce an excellent quality of meat, which is said to be fine-flavored, tender and juicy. As breeders they are prolific and the dams make good nurses.

The following is the scale of points fixed upon by the association:

Color—White, with occasional dark spots in the skin. 2
Head—Small, broad, face with medium dish. 3

Ears—Fine, pointing forward.	2
Jowl—Medium size and neat.	1
Neck—Short, full and well arched.	3
Shoulders—Broad and deep.	7
Girth around heart—Good.	6
Back—Straight, broad and level.	12
Sides—Deep and full.	6
Ribs—Well sprung.	7
Loin—Broad and strong.	12
Flank—Well let down.	2
Ham—Broad, full and deep, without loose fat.	12
Tail—Medium, fine and curled.	2
Legs—Fine and straight.	3
Feet—Small.	3
Hair—Fine and silky, free from bristles.	3
Action—Easy and graceful.	4
Symmetry—Adaptation of the several parts to each other.	10

Total. 100

There is a beautiful specimen of the breed delineated on the first page of the record. It represents "Billy Barlow," a famous boar at 15 months, when his weight was 485 lbs. The straightness of outline and the filling up of the hams and shoulders are almost perfect, while the wealth of flesh on cheeks and jowl are all that can be desired.

Whether this breed will as yet produce true to type is, we think, an open question. It is not long established, in which case it is quite probable that there will be instances not a few showing atavistic tendencies. However, if properly managed, these will in time give way. It is not at all improbable that there will be a successful future before this latest of the established breeds of swine.

Veterinary.

FOR THE CANADIAN LIVE-STOCK AND FARM JOURNAL.

Acute Indigestion.

BY F. C. GRENSIDE, V. S., GUELPH, ONT.

The term acute indigestion is used to signify the existence of repletion of the stomach with food. It is a serious disorder in the horse, for anything like severe cases are very apt to terminate fatally, consequently it is important that every precaution should be taken to avoid the trouble. A considerable number of cases are met with this time of the year, so that it is an opportune season to offer a few words of timely warning.

If the stomach becomes gorged so that it cannot act promptly upon the ingested food, the process of fermentation soon begins, gas being evolved, which increases the distension of the organ and adds to the paralysis of its coats; so that very frequently little response is derived from the giving of medicinal agents.

We find that under some circumstances horses are predisposed to this trouble. If they are weak from any cause, particularly from fatigue, as after very hard work or a long journey, the stomach along with all other organs, experiences more or less inability in the performance of its office; so that food should be given in such a case in restricted quantities, and of an easily digestible character.

Exertion, especially of a violent nature, interferes with the activity of the stomach, impairing its power for the time. Due regard should be paid to this in feeding a horse before work, and a quantity given inverse in proportion to the severity of the work. Ravenousness in the consumption of food is also a cause, for if it is taken too rapidly into the stomach, it overpowers that organ. Examples of this are frequently seen in turning animals out to grass for the first time, particularly if the feed is plentiful. There is very little danger on spare pasture, but if it is luxuriant, the precaution should be taken to only allow access to it for a short time, or until the keenness of the appetite is appeased.

Cattle and sheep frequently suffer from the same trouble, but fortunately in those animals acute indigestion is more amenable to treatment, although it often proves rapidly fatal if not attended to.

All forms of moist food should be used with care, as they are more readily fermentable, and are apt to be too quickly consumed. Draughts of water, particularly if large, and of low temperature, taken on a full stomach, are liable to interfere with digestion seriously.

Evidence of acute indigestion usually presents itself during or shortly after feeding, or after the animal has been put to work. If at work he will begin to sweat profusely, and show dullness, and if he is stopped, soon shows uneasiness by pawing, kicking, and attempting to lie down. Belching is usually noticeable, and is strongly indicative of this trouble. The belly is distended to some extent with gas, but is not so full and tense as in flatulent colic, unless it co-exists with this disorder, which it sometimes does.

The pain, as evidenced by uneasiness, is constant, usually not of a very violent character, but of varying intensity. The pulse is at first strong and full, but as the dulness and stupor increases, it loses its volume and force, but increases in frequency. Recovery may occur in from two to five hours; but if the condition is not relieved either spontaneously or by medicinal agents, death may result from exhaustion, for there may be very little evidence of anything wrong *post mortem*.

The result of indigestion most to be feared and which somewhat frequently occurs, is rupture of the stomach. Vomition is the most reliable sign of rupture having taken place, though a horse does occasionally vomit when there is no rupture. If in addition to the vomiting the ears and legs become colder and colder, and cold sweats bedew the body, with tremors of the muscles, and the pulse becomes weak and imperceptible, there is little doubt that rupture has taken place, and that the death of the patient is inevitable. If a horse becomes attacked when being driven, or at work, he should be laid off immediately.

A good domestic remedy, if given at the outset of this attack is a teacupful of whiskey, gin, rum, or brandy, with a tablespoonful of ginger in a pint of cream, or raw linseed oil. A two-ounce dose of oil of turpentine, in cream or oil, sometimes acts satisfactorily. Blankets wrung out in boiling water and applied to the belly are beneficial. Acute indigestion in cattle or sheep, frequently arises from much the same causes as in horses. In addition to those already mentioned, there are frozen roots, and frosted grass, or clover with the dew on it. Turnip tops and rape also sometimes bring it about, under certain circumstances. Fat cattle that are getting much rich food often suffer from weakness of the stomach, and will bloat up if given pea or corn meal, or any heavy, close ground grain, if not mixed with chaff, or cut hay. Bloating in cattle yields very readily to treatment as a rule. In urgent cases the gas is very readily got rid of by using a trocar and canula, in the most prominent part on the left side. A sharp penknife and quill have been known to do good service in the absence of better instruments. In the majority of cases there is no occasion to use surgical measures, medicinal agents working well.

It is seldom but what a case will yield to a pint of raw linseed oil or cream, and two or three ounces of oil of turpentine. In a sheep a fourth of this quantity will suffice.

Recurring bloating in ruminants is best treated by a change of diet, and restricted quantities of food, with exercise, and the administration of a purge.

The Farm.

A METHOD that commends itself, especially in the management of light soils that lack body, is to sow rye with the corn after the latter has become so well started that the cultivating has to be stopped. With the last run of the cultivator, seed down to rye about $1\frac{1}{2}$ to 2 bushels per acre. The advantages of this are that it acts as mulch after the corn is cut and prevents loss of much nutriment through the fall rains; a loss which is far greater on a light soil than most are aware of. Ploughed under in the fall, it serves to bind such a soil as we have mentioned and greatly increases its fertility. Rye decays more rapidly than clover and other like plants, and, hence, on heavy soils where the latter could not be used to advantage the rye would serve a good purpose.

We remember once assisting in removing a mow of hay. It had been put in by system, so that every forkful lifted could only be got out by taking it in the order the converse of the way it had been put in. It is scarcely necessary to add that the careful, systematic way in which it had been stored facilitated in a marked degree the ease with which it was removed. No time was wasted in unsuccessful attempts to lift a forkful, nor need the pitcher waste one moment in ascertaining where to lift next. Thus it is with some men on the farm in everything they do; it is done by a system, and always with a regard to the saving of labor. The man who mowed that hay lost no more time in doing it than if it had been done in a slipshod fashion, for doing things by system is always in the end the most expeditious way of doing them. Some men make every movement count to advantage, while others do things in the roughest possible manner and overtake no more work in the end. It is wonderful how much intelligent thought may be utilized to advantage in performing the most simple mechanical labors. In fact, this is the secret of the main difference between a good work hand and an inferior one. The former brings his mind to bear upon his work, while the latter does not.

KEEPING the soil constantly stirred is one of the best methods of tiding plants over a season of drouth, as well as one of the most effectual ways of ridding the land of weeds. Water not only enters largely into the composition of all animal and vegetable bodies, but it also is the carrier of all nutritive material to the plants, acting similarly to the blood of animals. All food must enter the plant from the soil in solution, and hence the great value of water. During the warm days of summer when the amount of water that descends as rain is less than the quantity evaporated, the crops receive their supply from the lower strata of soil by the force of capillarity. The soil is full of small pores or tubes that bring the water from the subsoil to the surface, when it quickly evaporates and passes off as vapor. It is the same principle by which the oil rises in the lamp wick. By cultivating or hoeing these tubes are disconnected and the evaporation is checked and the loosened top layer acts as a mulch. Storr's Experimental Station found that a heavy soil lost 4-10 of an inch less water and a light soil 6-10 less by evaporation when stirred at the surface than when not stirred, showing conclusively that the loosening of the soil lessens the evaporation and materially decreases the injurious effects of a midsummer drouth.

An insect may be killed in several ways, and the importance of having an insight into at least a few of

their peculiarities of structure cannot be too highly estimated. In respect to their mouths, they are popularly divided into two types, viz., suctorial and masticatory. Among the former are found the bugs and other like insects, possessed of a long tube-like apparatus, which they insert in the tissues of the plant and abstract its juices. It is obvious that the only means of combatting such as these is by treating them with something that either by smell or contact with them will work its effect, as for instance pyrethrum, and it is equally obvious that to apply such substances as Paris green to such insects as plant lice would be equally futile, as the good results following the use of this insecticide depends on it being eaten and taken into the stomach. The latter is the best remedy for those coming under the division having masticatory mouths, and live by chewing leaves or other tender portions of the plants they infest. The breathing organs of an insect are also peculiar in structure and action. They breathe by means of small openings along the sides of the body, and in the case of some larva, such as that of the warble, for instance, that trouble cattle so much, advantage is taken of this fact and the back of the animal so troubled is coated with a mixture of lard and sulphur, which, stuffing up the breathing pores of the larva, kill them.

Hay Making.

While there is much difference of opinion as to the methods that should be adopted in curing hay, there is agreement as to the fact that hay, unless when freshly cut, is much injured by exposure to rain.

As to the precise nature of the extent of the injury there is also a great lack of unanimity of judgment. Some regard the injury as arising simply from the less palatable nature of the hay, which is, however, a mistake. Hay injured by rain, or even by a succession of heavy dews, is less nutritive than that cured without rain. The loss consists in the dissolving and washing out of much of the starch, dextrine, and a good part of the ash ingredients, all of which are of much importance as food factors in the animal economy. If the rain is prolonged or comes in the form of frequent showers, there is a tendency to develop fungi, especially where the hay is in the cock or in the winrow. These are supposed to be very harmful to live stock, and it is uncertain as yet as to whether steaming will render them innocuous.

Especially is this the case where hay is put into the mow before the natural juices are sufficiently extracted, or before the water from rains is entirely removed. This growth appears in the form of mould, and when not easily detected by the naked eye, its presence is manifested by the dust that arises in handling the hay.

The tendency of salt or lime upon hay in the mow is to check fermentation and thereby check the growth of fungi. Where the hay is free from weeds and properly cured, the application of salt or lime is unnecessary; but when damp, and when weeds are numerous present, the application of salt especially is important, at the rate of, say from one peck to one half bushel per load. The weeds do not dry so quickly as the hay, and so tend to produce fermentation if put into the mow with the hay when the latter is sufficiently cured.

When hay is cut quite early there is, of course, much more difficulty in drying it, and, therefore, salt in such instances may almost always be applied with advantage. Another gain from the use of the salt is that it renders the hay more savory and hence more acceptable to cattle.

From its practical aspect no very strong arguments

may be advanced either in favor of early or late cutting. In following of the former the work would be distributed more evenly, allowing an intermitting spell that is usually appreciated. In this connection, however, it remains to be said that the younger the grass, the greener it is, and hence the longer it will take to cure, and become sufficiently dry to haul in. This is a point of some importance when the danger of rain is considered, and the amount of damage resulting from the same. The better aftermath following early cutting is another item in its favor, giving the animals a full bite where the other would supply but little.

It is the testimony of the chemist, however, that so strongly approves of early cutting and as forcibly denounces late cutting. In ripening much of the nutriment contained in the stem and leaves passes up to the seed, and is there stored. There is also a decrease in water and an increase in fibre, which materially lessens the digestibility of the fodder. In curing and handling timothy or clover that has been allowed to ripen thoroughly, the greater quantity of the seed is lost. Even supposing that there is no loss in nutritive substances, the fact that the fodder becomes more indigestible, owing to the increase of the tough fibre, should determine the preference for early cutting. The point that the chemist emphasizes is, that the timothy or clover should be cut as soon as full bloom is reached, instead of waiting until the appearance of the "second bloom;" for if cut when the plant is just at this stage the stem and leaves are then in their richest condition for feeding purposes. In the ordinary mixture of timothy and clover, used for hay in Ontario, it is difficult to get them equally matured. It is better, however, to err on the early side rather than on the late. Orchard grass and red clover ripen more nearly at the same time, and for this reason are preferred by many, though the former is more coarse and grows ranker than the timothy.

In meeting the attacks of some of the insects that do damage to the hay crop, early cutting is an important factor. Last year the grasshoppers were excessively numerous, and played havoc with many hay-fields. In his latest report Prof. Fletcher says that he is strongly of the opinion that had the hayfields been cut the 20th of June instead of the beginning of July, the hay would have been just as good, and enormous numbers of these locusts destroyed; the reason being that at the time stated they were so immature that they required shade, and not being possessed of wings they could not move from field to field. By leaving the hay standing until the first of July they had reached the final stage in which they can fly, and they were by this means enabled to emigrate from field to field, which they could not have done by hopping when younger. The clover seed midge may also be considerably decreased by cutting the latter part of June before the egg is laid in the flower heads of the clover. By cutting early, the second crop may be allowed to run to seed with safety. This insect lays its egg in the heads, and the larvæ, soon after hatching, eat their way into the pods and feed on the seeds, many cases destroying the crop completely.

The old method of curing hay by putting it in cock, popular amongst those of a former generation, is doomed to wane before the impatient methods of today. We do not regret that the death knell of the old system has been sounded now that more expeditious ways, and equally efficacious, have been introduced.

There is no question that curing hay in the cock makes an article of excellent quality when properly done, but the process adds very largely to the cost, and the liability to wetting is rather increased than

decreased, as compared with curing hay by the use of the tedder, owing to the longer period that it must remain outside. Before the age of tedders, curing hay by means of cocking was undoubtedly commendable, but now as good a product may be obtained without cocking at all, with much less risk, and with probably not more than one half the labor. We refer to the process of curing by use of the tedder, which allows the juices of the hay to evaporate so rapidly by the free action of the air and wind that cocking is quite unnecessary unless in the case of clover cut in the early stages of growth, when in any case it may take several days to cure unless the weather is unusually bright and airy.

The principal advantages of cocking so far as the quality is concerned, apart from protecting from rain, are, that it tends to preserve the color and also the aroma of the hay, but if the hay can be cured with one half the trouble by the use of the tedder, and the risk of injury from wetting, we can afford to have a little of the brightness lost. Hay cured with the wind and air and some sunshine is bright enough for any purpose, providing it does not get any rain, and when put into the mow at the right degree of dryness, the gentle fermentation which it there undergoes is serviceable, perhaps as much so as that which takes place in the cock when the hay is cured in this way, as it preserves the aroma.

Four methods of curing hay, as practised by modern hay-makers, are to be commended, though not equally applicable under all conditions.

1. Mow in the morning, use the tedder sufficiently often, and house before night.
2. Mow in the late afternoon, and ted and house the next day, as in the first instance.
3. Mow in the morning, ted at mid-day, cock before the dew falls, and open out the first or second day, and draw.
4. Mow in the afternoon, ted next morning, cock same evening, and open out when nearly dry enough to draw.

The first of these methods is adapted to the curing of hay when nearly mature, and is certainly preferable where it can be adopted. The second is adapted to duller weather, and an earlier stage of cutting; the third to clover nearing maturity; and the fourth to clover cut greener. When the weather is good, cocking may be dispensed altogether, as winrows will answer every purpose.

New Method of Destroying Injurious Insects.

Recent experiments in entomology has opened up a new field for workers in this direction. From observation and careful examination, Prof. Forbes of Illinois University, has discovered that many destructive insects are sometimes attacked by a species of fungi which kills them in great numbers, as the germs spread very rapidly.

As these germs can be cultivated in suitable solutions, and increased greatly in numbers, the researches of this Professor give rise to another branch of economic entomology of great worth. By taking a very small drop of fluid from a diseased insect, and putting it in a beef broth under suitable conditions of temperature, the germs rapidly increase in numbers, making the fluid a milk white. Now it is stated that a quart of this fluid poured into a barrel of water, would furnish a virus of sufficient strength to communicate this disease to multitudes of the insects. Dr. Lugger has experimented in this direction on the chinch bug (*Microfopus leucopterus*) with great success. He collected a number of the diseased bugs, and sent them in

tight boxes to eighteen places in Minnesota, where the ravages of these insects were very great. The contents of the boxes were thrown into fields attacked, with the result that the bugs were totally exterminated, and not a living specimen was to be found in the fields, as the latter had become centres of distribution of the disease. It is the intention of these experimenters to verify this by continuing their researches in this line, as they think the disease might have been transplanted naturally, and not by the sick bugs sent. However, the field they are opening is a fertile one, and worthy of elaborate researches.

Cut-Worms.

BY PROF. JAN. FLETCHER, EXP. FARM, OTTAWA.

Of all the injuries committed year after year upon field and garden crops, there are none concerning which more enquiries are made than of the various caterpillars known as Cut-worms. During the past season, however, possibly owing to the exceptional climatic conditions during the autumn of 1887 and the spring of 1888, various species of these caterpillars appeared in overwhelming numbers, in all directions. During the month of June, letters and specimens poured in. There was no province in the Dominion from which complaints of their depredations were not received. From British Columbia I received the variegated Cut-worm (*Agrotis saucia*), and some chrysalides which turned to *Ag. obeliscoides*, Guen. From Manitoba, the W-marked Cut-worm (*Ag. claudestina* Har.) and *Ag. declarata*, Mor. From New Brunswick, the Gothic Dart moth (*Ag. subgothica*, Haw.). From Nova Scotia came the last named and the Lance Rustic (*Agrotis ypsilon*, Ratt), and from Cape Breton, the caterpillars of a moth, which has been kindly identified by Prof. Riley as *Ag. turris* Grote.

In May and June the fields simply swarmed with these injurious caterpillars, and great injury was done to field crops. When cut-worms only appear in their ordinary numbers, there are certain remedies by which their ravages can be kept within bounds; but when they suddenly occur in the countless myriads, as our fields were overrun by last spring, all ordinary methods of meeting their attacks prove entirely inadequate. Cut-worms are the caterpillars of dull-colored active moths belonging for the most part to three genera, namely, *Agrotis*, *Eudena* and *Mamestra*. Now, these three genera alone contain more than 340 described species. Of course the different species vary somewhat in their habits, but taken as a class they are very similar, and in the present state of our knowledge, it will be more convenient to treat them as a class, at any rate in a report like this, which is prepared particularly with the hope of helping farmers to overcome their insect foes. As cut-worms are the caterpillars of so many different species of moths, the inaccuracy of speaking of them as that cut-worm is apparent. Moreover, many other insects are sent in and reported upon as cut-worms which do not belong to this class at all. Of these the white grubs, the larval state of the June Bugs (*Lachnosterna*) are most often referred to. There is some reason in this from their occasional habit of biting off plants in the manner of the true cut-worms, which are the caterpillars of the moths referred to above. They may be described in a general way as smooth, almost naked, greasy-looking caterpillars of some dull shade of color similar to the ground in which they hide during the day. The head is smooth and shining, and sometimes of a different color from the rest of the body. On the top of the segment next to the head is a smooth chitinous plate known as the thoracic shield. There are generally three or four series of bristle-bearing tubercles along each side of the body, and when disturbed the caterpillars curl up into a ring.

Their habits are almost always nocturnal, lying hid by day just beneath the surface of the soil; they come out at night to feed. When, however, they develop in large numbers, they frequently change their habits and feed by day, owing probably to the reduced food supply consequent upon their ravages. The habits of most cut-worms are probably as follows: The egg is laid in the spring, summer or autumn, and the insects may pass the winter either in the perfect moth state, as a young half-grown caterpillar or as a chrysalis. Those which hibernate as moths lay the spring

eggs, and moths are produced again before winter sets in. The eggs which are laid in the summer or autumn hatch soon after, and the caterpillars either become full fed the same season and pass the winter underground in the chrysalis state, or after feeding for a short time, become torpid and pass the winter as half-grown caterpillars. In this condition they may be found late in the autumn under stones, logs or heaps of dead vegetation, in the roots of grasses, or in cells beneath the surface of the ground. The ravages of the young caterpillars which hatch in the summer and autumn are seldom noticed then on account of the abundant vegetation at those seasons. In the spring, however, not only are the caterpillars much larger and capable of more mischief, but the land is cleared of all weeds and vegetation, other than the crop which is to be grown, and when the cut-worms, revived by the warmth of the sun and the opening of spring, come from their winter retreats, there is nothing for them to eat but the farmer's early crops. They are particularly troublesome in gardens, cutting off young cabbages, tomatoes and other plants as soon as pricked out. When the caterpillars are full-fed they burrow into the ground to a depth of some inches, and turn to brown chrysalids inside a smooth cell or a light cocoon (Fig. 1). From these after a few weeks the perfect moths emerge. They are very active at night, and when disturbed have the same habit as their caterpillars of dropping to the ground and remaining perfectly still as if dead. From their dull color they are then difficult to find. When at rest their wings lie horizontally over their backs, and the upper ones entirely cover the lower pair. The upper wings are generally crossed with one or more wavy lines and always bear two characteristic marks, one about half-way down the wing, orbicular in shape, the other, nearer the tip, reniform or kidney-shaped.

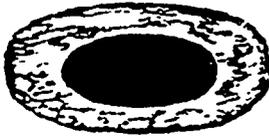


Fig. 1.

Fig. 2 shows a common and very injurious species, the Lance Rustic Moth (*Agrotis Ypsilon*), and its caterpillar, the Greasy Cut-worm. From their nocturnal habits cut-worms frequently do a great deal of harm to vegetation without being recognized as the cause. It is important in the view of discovering useful remedies to ascertain as soon as possible the habits of all these caterpillars.



Fig. 2.

Those of which the preparatory stages are known may be divided into three classes: 1. Climbing Cut-worms, or those which climb trees and destroy the buds. 2. Surface Cut-worms, or those which live on the surface of the ground and cut off herbageous plants just beneath the level of the soil. 3. Those which combine both of these habits.

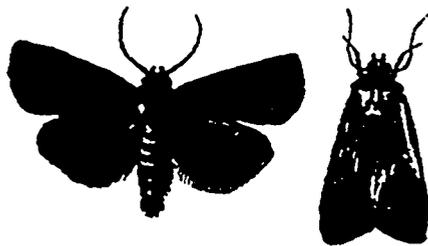


Fig. 3.—*A. subgothica*, a Surface Cut-worm showing wings expanded and folded.

Remedies.—There are many remedies which may be tried for cut-worms, some of which will usually answer the required purposes. When, however, as stated above, the caterpillars appear in enormous numbers and materially reduce their own food supply, no remedies except killing them will prevent them from attacking plants. There are a great many beneficial insects which help to keep these pests in check. Various Hymenopterous four-winged flies attack them as well as the parasitic *Tachina* flies and True

Bugs. In addition to these, however, there are some large ground beetles known by the name of *Calosoma*. These should be known by sight by every gardener and farmer; they are amongst his best friends; but being usually found amongst the injured plants where they are hunting for the injurious cut-worms, their mission is misunderstood, and they are frequently destroyed. Fig. 4 shows the Fiery Ground Beetle (*Calosoma calidum*, Fab.) a common and very useful species, the grub of which has been styled the "Cut-worm Lion."



Fig. 4. Cut-worm Lion (*Calosoma Calidum* Fab.)

Artificial remedies will, of course, vary with the habits of the caterpillars to be guarded against.

For the Climbing Cut-worms the best remedy is to place round the stem of the tree or bush to be protected a strip of tin six inches wide; the lower edge can be pressed into the ground and the tubular shape is easily preserved by securing it above with a piece of twine. This will effectually keep all Cut-worms from the tree, for these heavy-bodied caterpillars are unable to crawl over the smooth surface. A similar expedient is to tie a band of cotton batting round the stem, the caterpillars being unable to crawl over this yielding material.

For Surface Cut-worms the most efficient remedies are the following:

1. Keeping down all weeds in the late summer and autumn months so as to deprive those species which hatch in the autumn of their food supply and winter shelter.
2. Late ploughing in autumn or winter so as to disturb them after they have gone into winter quarters. The value of this treatment lies chiefly in breaking the cell they have made as a protection from the cold of winter, at a time of the year when they will be unable to make another.
3. Burning off all stubble and rubbish as late as possible in the spring, when many of the caterpillars and eggs of some species will be destroyed.
4. Placing some substance with an obnoxious odor around young plants when first set out, as fresh gas lime, sand, or sawdust saturated with coal oil or carbolic acid.
5. Traps. Prof. Riley has found that they may be destroyed in large numbers by setting poisoned traps between the rows of the crop to be protected. These are made as follows: having procured a supply of some succulent plant as grass, clover, or "lambs quarters" (*Chenopodium album* L.), tie them in loose bundles and sprinkle them heavily, or dip them in paris green and water. These are placed between the rows. Tying them in bundles has the effect of keeping the traps green and fresh for a longer time. "Lambs quarters" is a favorite plant with many kinds of cut-worms, and it will be noticed that where this plant grows, it is much more attractive than most plants grown as crops. This plant springs up everywhere in cultivated land. I believe that if strips of it were left at intervals in the fields, they would draw off the attack from the crops. A noticeable feature with this weed is the ease with which it can be destroyed. From the habit cut-worms have of cutting off the stem of an attacked plant, and remaining close to its root in the day time, and from the fact that when this plant is injured it fades quickly and turns to a whitish tint, the presence of cut-worms in these rows can be detected at a glance, after a couple of hours of sunshine. They should then of course be dug out and destroyed. After the season for the cut-worms has passed by, these strips can be run over with the cultivator and will give no further trouble.

6. Wrapping. Young tomatoes and cabbages may generally be protected in a large measure from the attacks of cut-worms, by simply wrapping a piece of paper around the stems at the time of planting, care being taken that it reaches above the ground for

about an inch. This remedy usually answers well; but last spring not even paper saturated with a mixture of coal oil and linseed oil kept the hungry myriads from the young tomatoes and cabbages. The same remedy is sometimes used in a modified form by making a cornucopia of paper and after putting some earth in it, put in the plant and sink it in the ground and fill up, leaving two inches above the ground. In short, the plant is planted in the cone of paper. By the time the roots have reached the paper it is decayed and forms no barrier to root growth.

A similar expedient is to place tomato tins, with the tops and bottoms cut out, over young plants the caterpillars being unable to crawl over the smooth tin.

7. Ditching. It must be remembered that cut-worms are essentially vagrants. They never stay long in any one place, but crawl long distances at night from place to place. In years of very bad attack it usually happens that certain fields are free from attack, whilst most of the others are badly infested. To prevent cut-worms from leaving a certain field or to keep them out of another, ploughing a deep furrow has been found useful in confining their ravages.

[Knowing that the ravages of these insects in the past seasons had created a desire for information in regard to their habits and means of destruction, we willingly co-operate with the Dominion Experimental Farm in giving the above extract from an article by Prof. Fletcher in their late report all possible publicity. Through the kindness of Prof. Fletcher we are enabled to reproduce the engravings as well, which our readers will no doubt fully appreciate.—ED]

Suggestions to County Councils.

NEGLECT OF AN IMPORTANT DUTY.

EDITOR CANADIAN LIVE-STOCK AND FARM JOURNAL.

SIR,—Many suggestions are made to relieve the present general depression in agriculture. The purpose of this brief paper is not to add to their number. Only the educated man with a trained mind is able, in the best way, to shape his affairs in accordance with varying conditions. So the present state of things especially impresses on us the necessity of having on the farm not merely men of muscle, but men of mind—men who are acquainted with the latest and best methods of farming—men who study the literature of agriculture—men who intelligently read the reports of the most recent investigations, such as the excellent bulletins of the Dominion Experimental station and of the Ontario Agricultural College. The country is expending annually a large amount in the maintenance of these institutions, and this is largely wasted unless the farmers of the country know the valuable results and apply the lessons learned.

It will hardly be disputed that many, perhaps the majority, of the Ontario farmers are not such men. Until recently, an early and thorough education was thought necessary only for the young men who intended to leave the farm. Now we see the folly of this. A great change is going on. Powerful agencies are at work. To give a single instance: The Farmers' Institutes, by causing an interchange of views among farmers, are doing much, not only to induce all to practice in many things the customs of the best, but also to quicken the leading men to original thought, experiment and wider reading.

But agricultural colleges are the most potent of these agencies. The founding of many such institutions in the States and elsewhere is a wise endeavor to meet the present threatening dangers of agricultural interests. Yet how very few farmers' sons take advantage of a course at the only agricultural college in the Province! Ought there not to be at least four hundred students from the farm in constant attendance? In reality not more than one-tenth of that number of such students attend. The chief reason of this must be that the farmers of Ontario are ignorant of the very great advantages which are offered them.

In order that these might be better known, the Government two years ago made provision that each county may always have one student at the college free of tuition. To what extent the councils have co-operated with the Government in this respect may be inferred from the fact that only 22 of the 50 counties and districts entitled to this privilege are at present represented at the college. Why this neglect on the

part of more than one-half of our councils? Possibly in many cases, because this privilege is regarded in a false light. It has been said that in some counties it is looked on as a charity to the young man thus sent. The purpose of this article is to seek to correct this misunderstanding.

To be chosen as the representative of a county ought to be deemed an honor. That it may be, let the privilege be granted by the councils as a *reward of merit*. Might not the council advertise that the competitor who shall send in the best essay, on some agricultural subject appointed by the council, will receive the nomination as a prize? Some councils are offering prizes for essays. This would virtually be a prize of \$40 for an essay. Further, would it not be well to require that the representative student shall, at the end of each college year, read a report at the meeting of the council, and answer the questions of councillors concerning the college and farm?

The good results are obvious. Only two or three may be mentioned: The ambition of some young farmers would be aroused. Wire-pulling for the nomination would be prevented. The requirement of an annual report would be an additional incentive to the student, while at college, to diligent study and careful observation. The councils would thus know the particulars of the work at the institution, and we should then have intelligent criticism rather than ignorant opposition. Many leading farmers might thus be led to co-operate with the Experimental Farm in some of their experiments, by means of which valuable results would be more readily secured and more widely adopted.

If the suggestions lead any of our councils to regard this neglect of the faithful discharge of an important duty as culpable as the neglect of immediate local duties; to regard the neglect, as it is in truth, a far-reaching injury; and immediately to take steps to select a representative, the writer will be glad, with others, to welcome the student at the college next October. In the hope that some may at once act in accordance with these hints, the following are suggested as suitable subjects for essays: "Advantages to the Farmer's Son of a Thorough Agricultural Education," "Green Coddors," "Dairy Farming."

E. LAWRENCE HUNT.

O. A. C., Guelph, Ont.

The Dairy.

EXPERIMENTS conducted by the Cornell Experimental Station go to show strongly that there is a loss of butter when the milk is allowed to cool much below the normal heat of the cow before setting, it being desirable to obtain as great a range of temperature as possible. In respect to heating the milk to secure this range the conclusion was drawn from these experiments that while there may not be any very great increase of butter when the milk is heated, there is no risk of injuring the quality of the butter by incorporating an excess of casein even when the milk is heated as high as 135 degrees.

By one in a position to know, it is estimated that in the State of Wisconsin alone at least 1000 silos will be built the coming summer, and anticipating that Canadian farmers are almost equally fully alive to the value of this agent in economical farming, we have spared no pains in aiding in disseminating knowledge on this subject. It will be remembered that in our last issue of May an able article from one of Wisconsin's silo experts, Mr. Adams, of the State Experimental Station, appeared, illustrated with engravings. We are pleased in this number to place before our readers the methods advocated by Prof. Robertson of the O. A. C., Guelph, one of the ablest writers on all topics relating to the dairy. By the amalgamation of these two articles, that of one of the best authorities across the line and that of the leading Canadian, the farmer cannot go astray.

Test of Dairy Apparatus.

With commendable enterprise the New Hampshire Experimental Station conducted a test to prove the worth of some of the many dairy utensils offered on the market of the day. The rules governing the test were elaborate, and hence will not bear reproduction. They, however, were of such a nature as to be equally just to each, and the conclusions drawn may be relied upon. The Moseley & Stoddard, Cooley, Shallow Pans, and DeLaval Hand Power Separator were entered. One representative of each system was allowed to witness all the operations. All the milk was set twenty four hours in water at a temperature from 70° to 80° as each system desired. The skimming was done by the surface skimmer of the Moseley & Stoddard and the bottom skimming device of the Cooley, and all others in their advertised method. The DeLaval vertical was run at not less than 40 nor more than 46 turns per minute. The cream from each was treated in similar manner, and the temperature of the churning was within 50 to 68° as desired by each representative of the respective systems, and the churning at such a rate as desired by each. The butter was worker-salted all alike by an experienced butter-maker not having the identity of the samples. The butter was then weighed and samples taken for analysis were also made of the skim-milk and buttermilk. The final award of merit rested upon the basis of the per cent. of actual fat that is recovered in the butter. The quality of the butter from each system was determined by a committee of experts, composed of C. H. Waterhouse, President New England Creamers Association, and W. H. Sadd, of Connecticut. The following table compiled from the result give their relative worth:

	Total fat in milk determined by analysis	Fat lost in skimming	Fat lost in butter-milk	Recovered in Butter	Per cent. of total fat lost in skim-milk	Per cent. of total fat lost in buttermilk	Per cent. of total fat recovered in butter
DeLaval Separator	5.9400	.4315	.1089	5.4118	7.26	1.83	91.10
Shallow six-quart pans	5.6500	.3976	.3140	5.2450	7.03	3.78	91.97
Moseley and Stoddard	5.9400	.3246	.6020	4.7734	5.47	10.13	82.21
Cooley	5.9400	.3094	.8718	4.8776	5.21	14.67	80.35

In the judging of the quality of the butter the following scale was adopted by the experts: Flavor, 50; grain, 25; color, 15; salt, 10. The shallow pan system secured 95 points, its superiority being in the flavor and color. The separator obtained 86; the Cooley 85, and the Moseley & Stoddard, 89. From this test the conclusion is drawn by the authorities that so far as one test conducted by competent and careful men can be relied upon the separator is first, the shallow pans second, the Moseley & Stoddard, third, and the Cooley last in point of efficiency.

Thorough trials were also made with the Blanchard, Davis and Stoddard churns, the result being such a slight difference in the efficiency of these makers that the experimenters say that any preference for any of them must come from convenience in the handling and ease of operation, and their opinion in this respect is that for ease in handling and cleaning, and for perfection of granulation of butter, the Stoddard churn stands at the head, the Blanchard in their minds being open to the objection that the granulation of the butter is interfered with by the inside floats it has. The Davis was found to be harder to operate than the others and more difficult to clean. The lat-

ter, however, excelled in point of time for churning, taking on an average 20 minutes, while the Blanchard took 47 minutes, and 29 minutes with the Stoddard.

Creaming of Milk.

In a recent bulletin on the composition of milk and some of the conditions which affect the separation of cream, Prof. Babcock, of Wisconsin Experimental Station, sums up the matter in the following five conclusions:

- 1st. That milk when fresh is a perfect emulsion, the fat globules being free, and without an envelope.
- 2d. That the chief difference in the composition of normal milks are due to variations in the amount of fat, the remainder of the milk, known as the milk serum, being quite uniform in composition in all milk. The variation in the amount of serum solids, in milk from the same cow, is rarely more than one-half per cent., in milk from different cows of the same breed is usually less than one per cent., and in milk cows of different breeds not more than 2½ per cent. This holds true even when the fat varies as much as 7 or 8 per cent.
- 3d. That milk contains a principle analogous to or identical with blood fibrin, which is capable of spontaneous coagulation, the clots of which entangle the fat globules, and to a considerable extent prevent an efficient creaming.
- 4th. That the most efficient creaming is obtained when conditions are supplied which retard or prevent the coagulation of fibrin. This may, in practice, be best accomplished by setting the milk directly after milking in cold water (ice water is best), the creaming vessel to be of bright tin, or other metal that can easily be kept clean.
- 5th. When the milk is transported, or when, for any reason the setting must be delayed, no method of creaming gives as satisfactory results as the centrifugal.

The Composition of Milk.

BY C. C. JAMES, M. A., PROF. OF CHEMISTRY, ONTARIO AGRICULTURAL COLLEGE.

The enormous production of milk on the farms of Ontario and its daily use in every household are quite sufficient reasons for the issuing of a bulletin upon its nature or composition, especially at this time of the year, the commencement of the milk-producing season. The facts are based on the work done at this institution during the past five years, where we have had special opportunities for studying the subject, as well as upon accumulating work on milk analysis which, once published, becomes the common property of all interested.

The constituents of normal cow's milk are the following: Water, fat, albuminoids, sugar, and ash or mineral matter. We shall briefly refer to them.

WATER.—This constitutes from 80 per cent. to 90 per cent. of the whole milk, and hence the total solids constitute from 10 per cent. to 20 per cent. In our experience here we have found the water of normal milk to vary from 83.9 per cent., the lowest, to 90.5 per cent., the highest, and the average from all animals, under all circumstances, to be 87.19 per cent.

FAT.—When fresh milk is observed under the microscope, it is found to be a clear liquid in which are floating clusters of fat globules, these fat globules varying in size from less than one ten-thousandth of an inch in diameter to about one two-thousandth of an inch in diameter. The large globules are observed in Jersey milk, and the small in Holstein. The fat, being lighter than the liquid or serum in which it is floating, gradually comes to the surface in the form of cream, and among the many circumstances affecting the rising of the cream the size of the fat globule is very important. The larger the globules the more quickly and thoroughly they will separate in a layer at the surface. There is a variation in different animals and in the same animals under different treatment, in the amount of total solids, and there is also a variation in the respective amounts of the constituents that make up the total solids; the variation, however, is principally due to the quantity of the fat, i. e., the fat in the milk of different animals and of the same animal, varies far more than the albuminoids, sugar and ash; hence it is that in making or setting an analysis of milk, the water, fat and milk

"I think the Journal is improving every month."—Samuel Clark, Saranac, Ont.

alone are generally considered. The fat may vary from 2 per cent. to 8 per cent. of the total milk. We have found it to vary from 2.4 per cent. to 7.5 per cent., and the average of all classes of milk to be 4.03 per cent. The fat, however, is far more complicated than at first is apparent. It is, in reality, a mixture of fat or oils, of which the four leading kinds are: *stearin, palmitin, olein, and butyryn*. The two former are hard fats, the two latter soft or liquid fats. The texture or consistency of the butter depends upon the relative amounts of hard and soft fats found in the milk, and this is influenced greatly by the foods of which the animal partakes. Butyryn is peculiar to butter; when the butter becomes rancid, the cause is in the fact that the butyryn has, by fermentation, been changed into butyric acid. Oleomargarine contains a considerable quantity of hard fats and less liquid fats, with no butyryn, unless it has been added in milk or butter.

ALBUMINOIDS—These are the nitrogenous compounds of milk, the flesh and muscle formers, the bases of the curd or cheese. In normal conditions they are dissolved in the serum or liquid. There are two forms, viz., casein and albumen. Some lately published investigations of Dr. Babcock, of Wisconsin (Bulletin No. 18), tend to the conclusion that minute quantities of fibrin also are found in normal milk. Casein, which passes into the cheese, is thrown out of solution, or coagulated by acids and by rennet; albumen is coagulated by heat. In the first milk or colostrum, the albumen is in excess, but in the after milk as we use it, the casein is in excess; the casein forms about 3.6 per cent., the albumen about 0.7 per cent.

SUGAR.—Milk sugar, or lactose has the same composition as ordinary cane sugar, but is less soluble, less sweetening in its effect, gritty to the taste. It forms about 4.5 per cent. of milk, and is liable to speedy change. During lactic fermentation, by exposure to the air, the milk sugar changes to lactic acid, *i. e.*, the milk sours. As a result of the formation of the acid, the casein is thrown out of solution, *i. e.*, the milk coagulates or curdles.

ASH.—There is but little variation in the quantity of salts or mineral matter above or below 0.7 per cent. From 30 samples we got an average of 0.695 per cent. The addition of such substances as borax, soda, salt, give a large increase in the ash. In 100 lbs. of milk, there are about 0.20 lbs. of phosphoric acid, 0.17 lbs. of potash, and 0.16 lbs. of lime, all of which are intended for the building of bones and the ash material of the animal body.

The milk produced at the Ontario Experimental Farm may be taken as an average of pure milk, produced from fairly good animals of all the various breeds and grades, with varied but good feeding and with good care. Our average of 92 samples, taken from five years' results, will therefore be a little above what is produced on many farms and supplied in many towns and cities.

Water	87.18	} Total solids, 12.81.
Fat	4.03	
Albuminoids and sugar	8.08	
Ash	0.70	

—Bulletin 39.

Canadian Cheese-making.

BY PROF. W. ROBERTSON, GUELPH, ONT.
(Continued from April.)

I will now offer some remarks on the details of the best practice in cheese manufacture for securing the superior quality which may be concisely specified as richness in flavor; richness in body, with attractive appearance.

FLAVOR.

The full flavor of a perfect cheese is a combination of four distinct flavors, which for convenience we will call "the cream flavor," "the fermented flavor," "the acid flavor" and "the salt flavor." It is the duty of the milk-producer—the factory patron—to see that the cream flavor is perfect in all milk supplied. This will imply the keeping of only healthy cows, receiving an abundance of suitable wholesome feed and pure water with access to salt every day.

The utmost cleanliness in pails, strainers and cans must be observed. Immediately after milking, all milk should be thoroughly aired by dipping, stirring or the use of an aerator. Contact with the air ripens the cream-flavor, and also by evaporation and oxidation purifies the milk from animal and offensive volatile odors. Especially should the milk be aired when

the weather is cool. I would think it unnecessary to add that milk and milk cans should be kept only where the surrounding air is pure, had I not occasionally found it to be very badly tainted by standing over night near where sour whey had been emptied for feeding. The surroundings of milk stands should always be free from all causes of objectionable odors.

RENNET.

In rennet there is introduced a new agency that creates a flavor peculiar to its own action; but there should be nothing in the rennet preparation that will interfere with the preserving a true cream flavor in the curd and cheese.

The presence of any foreign matter, like sour whey or badly-prepared rennet-liquid will begin the formation of a competing flavor that will by its own strength daily increase.

A healthy cream-flavor cannot survive in the presence of a foul odor arising from any cause. In milk of good quality and which had been properly matured, I prefer to use sufficient rennet to coagulate for cutting in from fifteen to twenty minutes in the spring of the year, and in from 40 to 45 minutes during the summer and fall. Rennet should be diluted to the extent of at least a volume of one gallon for every vat, and then thoroughly distributed by stirring.

BODY AND TEXTURE.

Every kind of cheese has body, but some sorts cannot correctly be said to have a cheese-texture. The demand of the trade is for a cheese with a rich, solid body, and a natural uniform texture. Putty has no definable texture peculiarly its own; for if it be bruised and worked over, it has lost none of its structural completeness.

Cheese that can be bruised and then by pressure made the same in texture as it was before, has somehow in the process of manufacture lost its natural texture. When milk is perfectly thickened we have the distinctive texture of curd; and it should be the cheese-maker's endeavor to preserve that identical texture in the cheese. The processes of manufacture as they affect the body and texture of cheese, should merely solidify and render less perishable the texture of the newly-formed curd. By careful examination of the surface of a piece of curd—broken when coagulation is just complete—there may be seen half-loosened flakes and lines very much in appearance like those that show on flint when broken.

Of course the curd in that early stage is quite unlike flint in body, a good deal less like flint than it sometimes is in the finished cheese, but still it looks like flint in natural structure. When a buyer says that for the London market he wants a cheese with a flinty, flaky texture, he does not mean that he wants a cheese with a flinty body from which, with his trying iron, he may strike fire.

SETTING TEMPERATURE.

The higher the temperature, the tougher will be the texture of the curd. The best setting temperature, considering texture only, is 82° to 84° Fah. But when milk has some taint, a higher temperature may be used to obtain an earlier separation of the whey. Then the consequent toughened texture may be shortened by a further development of acid. If the milk be over-ripe or acid, shortness of grain in the cheese can be avoided, and that tendency remedied by setting at a higher temperature. The acid condition of some milk may also be corrected by the use of an extra quantity of rennet.

In such milk as much as seven or eight ounces of ordinary extract of rennet per 1,000 lbs. of milk, might be used with advantage. The rennet action would thus be kept in advance of the acid action. Then extra heat, acid development, additional stirring and extra salt might be so used that curing would not progress faster than if only three ounces of extract had been used. Sometimes there is a waste of fat into the whey, from imperfect coagulation, when the rennet has not been thoroughly mixed with the milk or when the mass has been disturbed during the thickening process. The making room floor should not vibrate easily.

CUTTING AND STIRRING THE CURD.

The cutting of the curd should begin as soon as it can be handled without waste. If it be delayed a whey flavor may be promoted in excess of a creamy one.

In no case should the cutting be put off after the curd will split clean when half lifted on the finger; they will ooze out of the particles the more readily

then than later. If the horizontal knife be used first there will be little likelihood of large squares of curd being left uncut. The retention of the whey between the horizontal layers of curd will also promote the healing of the cut surfaces. Cubes $\frac{3}{8}$ of an inch are found to be the most convenient size.

With a few minutes' delay after the first cutting, the process should go on without intermission until it is completed. Then stirring should immediately commence. The original structure of the curd should not be injured thereby. The motion should be continuous. Motion is helpful, as heat is helpful to the rennet in bringing about the separation of the whey. Stirring should be kept up for at least ten minutes after the desired temperature has been reached, and should generally continue until the curd feels firm and india-rubbery when pressed in the hand.

HEATING.

Heat should always be applied gradually, raising the temperature about one degree every five minutes. Should the condition of the milk require that the process be carried on fast, then the milk should be heated rapidly before the rennet is added. Afterward the curd may be dipped as soon as it is firm enough to handle without damage. The best temperature is from 96° to 98° Fah.

Careless heating will cause cheese to be porous. Heat should not be applied till whey has separated freely, and where possible, hot water, in preference to "dry" steam, should be used under the vat pans. All scorching of the curd will thus be avoided. Extra heating as well as extra stirring will produce a cheese that will cure more slowly and that will keep longer. But there is a likelihood that that kind of keeping cheese will be kept longer on the consumer's table, and that sort of keeping quality is not desirable. If the temperature be raised above 98° the tendency is to toughen its texture, thus casing in the globules of fat in such a way that they are not tasted in the eating of such cheese. If the temperature be not raised to 96° the effect will be to leave an excess of moisture in the curd which will leave the cheese short-lived.

DIPPING THE CURD.

The whey should invariably be separated out of the particles of curd before the presence of acid is perceptible by taste or smell. The hot iron test is a helpful guide as to the time when the whey should be drawn; and it should be applied every day for every vat. As soon as fine hairs show on the iron, the whey should be removed.

The early drawing of the whey drains off many germs of objectionable flavors that flourish and multiply best in liquids. A more thorough airing of the curd is also made possible, by which its own flavor may be purified, sweetened and developed.

This is, perhaps the most important stage in the process, so far as effect on flavor is concerned, and the essential condition is to have the whey separated out of the curd before the development of acid, more than to get the curd out of the whey.

TREATMENT IN THE CURD SINK.

I mention the need for keeping the racks and strainers perfectly clean. In but few factories where the sink-racks are made of square slats are they properly cleaned. I advise every maker to make kindling wood of all square-slatted racks and to procure those made with bevelled hard-wood slats, say two inches wide and bevelled to an edge on both sides. The odor from the thickened residuum of whey in the sinks often gives curd a foul flavor. The curd should be well aired and carefully and gently stirred till the required state of dryness has been attained. It may then be closely packed and kept at a temperature of at least 92°. Frequent turning assists the action of the rennet and heat in expelling and separating the remaining whey. About this stage the development of the acid flavor should be perceptible to the taste and smell. It should be developed, not merely to aid in keeping cheese solid and to assist in giving cheese the requisite shortness of texture, but also to retard the decomposing action of fermentation in ordinary cheese. Lactic acid destroys many noxious germs that would otherwise multiply into offensive taints. When the curd, after matting, is well locked up in the sink, besides the uniformity of temperature thus secured, some advantage to the texture seems to result from the pressure thus given. Firmness combined with buttery body is thus gained. When the curd becomes of leafy, stringy, flaky texture, it may be prepared for the cutter. The proper condition is

just when the flakey leafiness of the texture changes into stringiness and the curd to the touch feels velvety and oily. After cutting, thorough aeration is in order; and if the curd has not then developed the peculiar smell that cheese-makers know by experience, stirring and airing should be continued.

SALTING.

Salt should be added for the sake of flavor, to meet the taste of consumers, and as salt is antiseptic in its action, it has some effect on the keeping qualities of cheese. Salt is so preserved by expelling moisture, and thus retarding the action of the curing fermentation. For cheese that are intended for immediate consumption, and all fodder-made cheese are especially such, the proper quantity would be between one and one-half and two pounds of pure salt per 1,000 lbs. of milk according to the degree of moisture in the curd when applied. In October and November from two to three and one-half pounds per 1,000 of milk may be used for export cheese.

HOOPING.

Curd should be put under pressure in the hoops just after the first hardening effect of the salt is passed. The whey draining from the sinks at this stage is most unpalatable to the taste and disagreeable to the smell. The leaving of the curd in the sink for an hour or more after salting often kills the rosy sweet flavor. If thorough airing at this stage be desired, it should be attended to before the salt is mixed in. A gentle pressure, gradually increasing in power, should be applied. Uniformity of texture is generally gained or lost by the use of the press at the proper time in the right way.

BANDAGING AND TURNING.

The flavor in cheese is sometimes injured by the use of impure greasy water on the unclosed ends. This is merely mentioned because some makers may have overlooked the danger from this practice. Every cheese should be turned in the hoops after pressure has been used for twelve hours. No cheese should finally leave the pressroom until it is true in shape, handsome in appearance and neat in finish.

CURING.

In the curing-room the temperature should be regular, between 70° and 75° for April and May cheese, and between 65° and 70° when possible for summer and fall cheese. Attention to this is very important in order that curing may proceed without check, and that the acid flavor may be changed into a pleasant taste.

With the lapse of time perhaps the lactic acid wholly disappears, but it leaves a very nasty, bitter taste behind it, unless the curing-room be kept warm. There should be good ventilation to purify the air and to replace from without the oxygen that is absorbed by the cheese in curing. I prefer a curing-room that is well lighted.

After this method may be made cheese which will look well on the outside and be of such quality inside that everybody will like them. I hope that you in the United States will make finer cheese than we have been making, and I promise you that we will then in Canada, if we can, be manufacturing still finer cheese than you produce.

Silo in a Basement.

EDITOR CANADIAN LIVE-STOCK AND FARM JOURNAL.

SIR,—Once more I am intruding on your good nature by asking for information re silos. I have a room in my underground stable about 18 x 14 and about 12 or 14 ft. high. It is built with stone all around with the exception of two windows and a door. I wish to know would this answer for a silo, and how would it be best to fix it up. Should I brick up the windows and sheet it up inside with lumber and fill in with sawdust or other like material? The top is a double floor with a room over it where I could place my cutter and let the cut corn drop through into the room below.

Deseronto, Ont.

W. C. B. R.

Such a room as our correspondent speaks of could without much outlay be converted into a good silo with the advantage of being excellently situated (as indicated by rough sketch sent us) for ease in feeding the cattle in the basement.

In regard to the boarding up of the inner walls, it is the almost universal testimony that wood not only

makes a cheaper silo, but that it preserves the ensilage better from decay. Stone being a better conductor of either heat or cold, the ensilage surrounded by stone walls is more apt to freeze during winter than if wooden walls with a dead air space enclosed it, and as it conducts the heat of the ensilage away before it has become heated enough to kill the germs and minute organizations that feed on the ensilage and bring about putrefaction, which results in great loss. Others object to the latter part of this theory and assert that allowing the ensilage to heat to kill the germs is like fanning the fire and trying to save the materials that are burning at the same time. The holders of this side of the question do not believe in heating at all, but fill in as rapidly as possible. The theorists may pick this bone of contention, however, for it does not influence the practical fact that wood has been found preferable to stone, and even many of those who have built stone silos have abandoned them and rebuilt wooden ones. The outside wall being of stone, no danger need be thought of in respect to lateral pressure, and hence, narrow studding, say 2 x 6 inches, placed at least 16 inches apart, would give a sufficient dead air space and answer the purpose. The size of this room will easily permit of this. On this, line with double row of boards, with tar felt between. The boards should not be too wide, or there will be a tendency for them to warp. Tongue and grooved boards are apt to break their connection, owing to the swelling caused by the moisture of the ensilage. The directions given in our last issue cover this ground, and hence, repetition here is unnecessary. Paint inside wall with a mixture of hot tar and resin, prepared as given in May number. This has a beneficial effect, not only on the keeping properties of the boards and ensilage by aiding in making them less porous, but it also permits the ensilage to settle easier. The filling of this dead air space with sawdust or any other material is not advisable, as it holds moisture, and tends to rot the studding and sides as is often noticeable, in the walls of icehouses so filled. Such a room, allowing 50 lbs. per cow per day, should furnish you with food for about six months, for a herd of fifteen cows. The windows should be made air tight in the manner suggested and boarded over, the whole principle being to keep out the air and keep in the heat.

Clover Silage—Ensilage without a Silo.

EDITOR CANADIAN LIVE-STOCK AND FARM JOURNAL.

SIR,—You ask me to give you my experience with clover ensilage, and in reply I must say that I have not been so completely successful as I ought to have been, or as I think I now could be were I to try it. The first experiment I made in ensilage was with clover, which I ran through the hay-cutter, and put into a small silo of 15 tons capacity. I wanted supplementary feed for my cows in August, and opened it just four weeks after closing it. When opened it was perfectly good though sour. The cows ate it well for a few days, but it then commenced to spoil, and in about a week more we had to throw it all out. I attribute this to the hot weather, the fact that the clover was cut too early, just in the blow, and that in its external succulent state the fermentation had not ceased when the silo was opened. Had it been cut when more mature, as I am now quite sure all crops for ensilage should be, and allowed to lie in the heap and heat up to 140° or 150° before spreading and treading in the silo, and been made into sweet ensilage, as I now do with all my ensilage, I am quite sure the results would have been far different. This experiment made in 1879, discouraged me, and I did nothing in the matter for several years. Five years ago, however, I built a larger silo, and the first season, having four acres of fair clover, I cut in the blossom, and put it in long, just carefully mowing it away and treading it as though it were hay, only putting it in as soon as cut, quite green. This was in the first week in July.

I covered it with planks and weighted them about 20 lbs. of stone to the square foot. In September I uncovered it and put in 2½ acres of corn, running it through the hay-cutter. This addition settled the clover very much, fully ½. When the silo was opened in November the corn was all good, but about ¼ of the clover was spoilt. I weighed a cubic foot of the clover and also of the corn next above it. The clover weighed 25 lbs. and the corn 53 lbs. There was about 40 tons of clover and 45 tons of corn.

From these trials I consider that in the first place it is necessary to cut clover much later than one would for hay. This can be done with safety, as handling it green it will not break and waste as it would if handled at such a late stage for hay, and the seeds will not drop out of it and be lost. Also I believe it necessary to put it through the hay-cutter as, if put in in forks, it will not pack as well as even long corn laid in bundles. However, I doubt the wisdom of ensilaging the first crop of clover. In this climate there is no great difficulty in making hay of it, and I know of nothing better to feed cattle than clover hay. If the first crop is cut early, as it should, there ought to be a nice second crop ready to cut at the same time the corn is ready to put into the silo, and I would recommend that the clover be cut up along with the corn and put into the silo with it. At that time of the year it is difficult to cure clover into hay, and I am sure the admixture of this clover will increase very much the value of the ensilage. I may say that last year I had a lot of late oats which were evidently not going to ripen, so I mowed them and cut them up with my corn, and put them into the silo, the result being very satisfactory, and I am sure that in this way I saved a crop that without the silo would have been almost entirely lost.

In all work with the silo I cannot too strongly urge that whatever be put into it be carefully packed and trodden down around the walls. I know that on this point I am not sustained by many who are now trying to make out that ensilage can be made almost any way; but I am sure that the absolute essential to success with the silo is the exclusion of air from the mass, and I believe that the only way to prevent air following down the walls of the silo is to very thoroughly tramp and pack the ensilage against them. Also, in spreading the ensilage after it has heated up to 140° or thereabouts, I think it is important to spread it evenly in beds or layers all over the silo, to do which I always move even the bottom of the heap to ensure none of the layers being more solid than the rest.

I shall conclude this, I fear, unsatisfactory contribution, with an account of what I saw on a farm in England last winter. I may say that, as they cannot raise corn there very well they use a great number of different crops for ensilage—common grass, clover, vetches, peas and oats, etc. On the Aylesbury Dairy Company's farm at Horsham, Sussex, I saw an ensilage stack of clover containing 200 tons of green clover. It was built in the centre of the field where the clover grew, and was made like we build a load of hay instead of like a haystack; that is, the sides were kept highest in building, and not the centre. It was built on the ground, but a number of heavy bed pieces of timber were laid down about 3 feet apart and about 3 feet longer than the intended width of the stack. The clover was then piled on for several days, probably to about 20 feet in height. Then wire ropes were laid over from one end of the bed pieces to the other, a small windlass being fastened at each end and the ropes drawn down as tight as possible, levers and a ratchet being used on the windlasses. The ropes were tightened all night, reducing the height about half. Next day more clover was built on, and next night a man was kept at the ropes. To finish off, the top was built up in shape of the roof of a barn, and thatched as the haystacks in England are. The stack was about 25 feet wide, 60 or 70 feet long, and about 13 feet high at the sides and 25 or 27 in the centre. The sides were so hard I could hardly pull off a handful of the outside. I saw a similar stack cut into and there was only about two or three inches of the outside hurt, and even that, when fed, as I saw it, to the cows, was all eaten. The clover was not cut up, but the stack was cut down for use with a hay-knife, as they cut haystacks in the old country. The apparatus of ropes, windlasses, etc., in England cost much less than a silo would. The one I saw for this 200 ton stack cost £19 sterling. Here it would be much higher, while a silo would cost not much if any more than that. On the same

farm there was another ensilage stack of oats and vetches, built in the same way. I may add that I sowed ten days ago 4 acres of peas and oats, which I expect will be fit to cut for ensilage about the first week in August. I propose to get ready for them a small silo of about 60 tons capacity, and put them into it for the purpose of feeding my cows from the 20th of September until the larger silo of corn is ready to open. I find my cows shrink in their milk too much in the fall, and I hope in this way to keep up the yield of butter at a time when the demand and the price are both good. I find the crops in the field are two early to be fed direct from the field after the 20th September, and I do not wish to be obliged to put my cows on dry hay at any time after having had the experience of several winters' feeding of ensilage. I make butter all winter, and find my cows will produce as much in the barn as at any time on grass, except for the first four weeks of the early pasture. This week 20 cows made me 164 lbs. of butter marketed.

J. A. FISHER, M. P.
Alva Farm, Knowlton, Quebec.

Building and Filling the Silo.

BY PROF. JAS. W. ROBERTSON, ONTARIO AGRICULTURAL COLLEGE, GUELPH.

BUILDING A SILO.

If a silo be erected as a separate structure, its foundation had better be a low stone or concrete wall. A clay floor raised above the outside level to prevent dampness will be cheapest and best. A sill of planks may be bedded on the top of the foundation wall. A common balloon frame may be erected by using as studs 16 ft. or 18 ft. planks, 2 in. and 10 in., or 2 in. and 12 in., placed 2 or 2 1/2 ft. apart. To secure these safely at the bottom against lateral pressure while the silo is being filled, they should be morticed and toe-nailed, or cut so that the heels will extend down in front of the sill as shown in Fig. 3. To give additional security, the planks for the sills may be cross lapped at the corners, as shown in Fig 1.

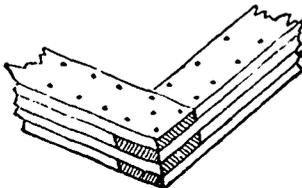


Fig. 1.

The roof will give additional strength to the sides for resistance to outward pressure if it be made after the truss pattern. Instead of ties or joists running straight across from the tops of the studs or the plates, where they would be in the way during the filling, they should extend like false rafters from the top of each stud to the rafter opposite, being spiked to it at about one-third of its length from the ridge. On the inside of the studs should be first nailed a lining of inch lumber running horizontally. It should be so put on as to make lock-joints at each corner, as shown in Fig. 2.

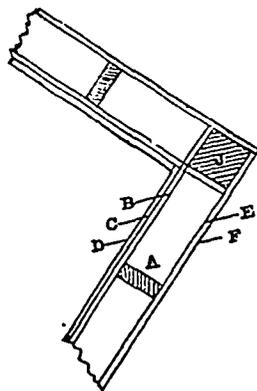


Fig. 2.

(A) Stud. (B) Inch lumber. (C) Tar paper. (D) Matched or planed lumber. (E) Tar paper. (F) Outside siding. (J) Post.

A covering of tar paper, with the edges lapped four inches, should then be tacked on. Over that should

be put inch lumber running horizontally, planed on the exposed side and all the better for being tongued and grooved. That will make a practically air-tight building. To make it also frost proof, the outside of the studs may be covered in a similar way. A single thickness of lumber can be made to do, but the double-boarding with paper between is preferable, since the tar-paper is thus kept close against the outside boards.

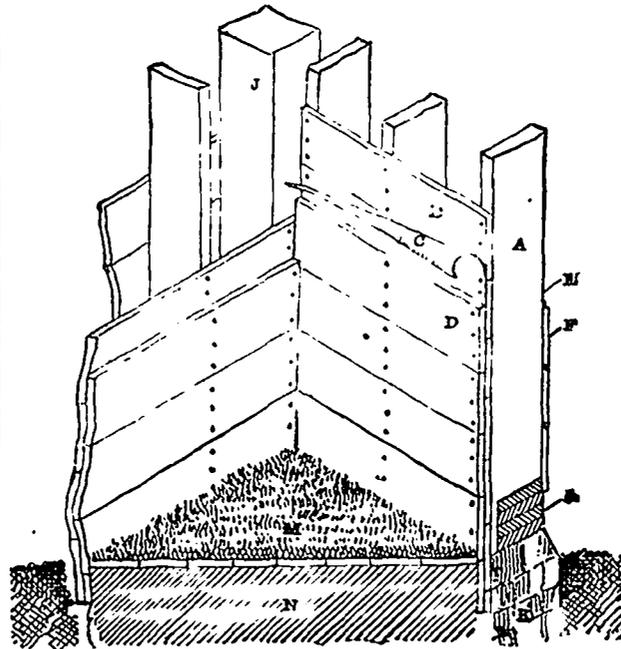


Fig. 3.

(A) Stud. (B) Inch lumber. (C) Tar paper. (D) Matched or planed lumber. (E) Tar paper. (F) Outside siding. (J) Post. (K) Stone foundation. (L) Sill. (M) Clay floor covered with cut straw.

The door should be of the ice-house style. A space between the two studs may be left unboarded, or may be sawn out flush with their sides. Cleats may then be nailed on and the short boards be filled in. Care must be taken to so place strips of tar paper that they will make the joints at both sides of the door airtight. A 10 or 12 inch board should be fastened into each corner to extend from the bottom to the top, and the space behind should be filled with sawdust.

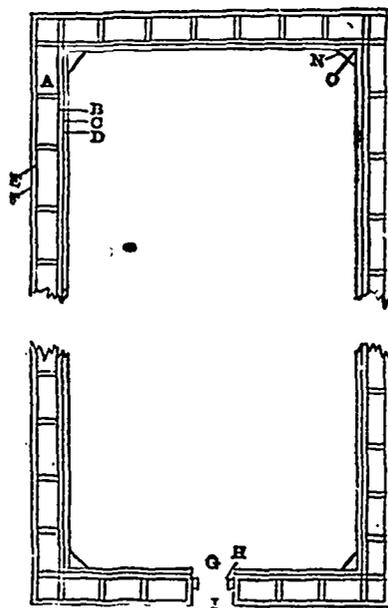


Fig. 4.

(A) Stud. (B) Inch lumber. (C) Tar paper. (D) Matched or planed lumber. (E) Tar paper. (F) Outside siding. (G) Door. (H) Cleats. (I) Outside door on hinges, and in two or three pieces. (N) Corner board. (O) Sawdust.

To preserve the inside lumber it should receive a coating of coal tar, mixed with a few ounces of resin, applied hot and liberally. Where a mow or a barn or part of some other building is to be fitted up for

silage uses, the inside finish of the silo should be the same as for a separate structure.

FILLING THE SILO.

For economical filling, the tools, implements and conveniences should, as far as possible, be adapted to the cheap and easy performance of the work. That implies the making the best use of the machinery already owned on the farm. For the cutting of the corn in the field I prefer and recommend a common corn knife, or an old fashioned sickle. A strong reaper may do the work by horse-power, but if the crop be heavy and the corn from ten to twelve feet high the rakes will not clear the board, and stalks will be dragged behind. For a hauling convenience an ordinary waggon may be made to serve by putting the wheels from a front axle on the hind axle. A truck or a waggon with low wheels and a large flat platform may be used. In either of these cases, by trailing a gang-way behind, the persons loading the fodder may carry it up in armfuls. These are not the best conveniences, nor do I recommend that way of loading. In the way now to be described the handiest kind of a truck can be provided. Three strong pieces of timber 6 by 6 inches and each 12 feet long are used. Strong poles will serve the purpose if flattened on one side. They are placed 16 inches apart, centre to centre, and the middle piece is extended 3 feet beyond the two outside ones. Three feet from the other ends of the two outside pieces a 2-inch plank, 8 feet long, is securely bolted across the three 12-foot pieces. A covering of planks is continued, each securely bolted, until the platform comes to the end of the two outside pieces, leaving the middle piece extending. Then by removing the reach from a common farm waggon, the platform so constructed can be attached to the under side of the axles. The middle pieces will serve the double purpose of a reach and front support. It can best be attached to the front axle by a long king-bolt passing down through it. A large, flat washer and a screw nut with a key under it will make a strong, suitable and safe connection. A brace passing back from the top to the front plank of the platform will improve the attachment. The two pieces extending beyond the platform at the other end are to be attached to the hind axle on the under side. Two clamps passing over the axle with a bar and nuts beneath the 6 by 6 pieces will fasten them securely to the under side. The "hounds" can be used as a brace by attaching the end of it to the middle piece through the hinder plank of the platform. A rough sketch accompanies this to make my description more easily and clearly understood. The stalks may be filled into the silo without cut-

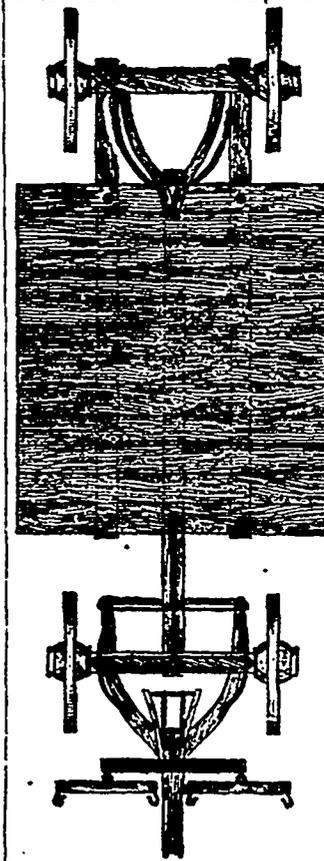


Fig. 5.

The stalks may be filled into the silo without cut-

ting, but more labor is involved and the work of emptying for feeding is rendered doubly difficult. Any strong cutter, with capacity for a large quantity per day, will serve the purpose. Carriers should be attached unless the cutter stands on a level with the top of the silo, which ordinarily is neither practicable nor desirable. Horse-power or engine may be used. Everything in the way of machinery equipment being ready, the filling may be commenced. From six inches to a foot of cut or uncut straw should be placed evenly over the bottom of the silo. Every farmer with a large crop should provide two of the carrying platforms already described. If the cornfield be near the silo, one team will do the hauling. The stalks can be loaded most economically direct from the root. If the crop be as ripe as it should be, wilting will be unnecessary. The person cutting the corn might as well throw it on the low platform as on the ground, and thus avoid the double handling. The teamster might at the same time be loading on the same platform the corn which will have been cut and laid in armfuls on the ground during his absence from the field with the previous load. At the silo the corn can be fed into the cutter from the wagon platform. The horses may be changed from the loaded to the empty wagon. At the cutting box two men will be required. A 2-inch cut is as good as an inch and a half, and both are better than one inch or less. During the filling care should be taken to occasionally level the heavier parts of the stalks out against the sides of the silo. The filling may proceed every day, every second day or every third day as may be found convenient. In either case the contents should be tramped around the sides and in the corners just before the addition of a new layer. When the silo is full, after the lapse of two days the sides and corners should be again thoroughly tramped and afterwards covered with a layer from two to three feet thick of any kind of straw, cut or uncut. It should be laid on close, and for that reason cut straw is rather preferable. It should also be closely tucked around the sides and into the corners. The silage may be thus left to cure and to keep until wanted, be that time four weeks or ten months.

SIZE AND COST OF SILOS.

A silo 10 feet wide by 50 feet long by 16 feet deep, inside measurement, will hold about 125 tons settled corn silage. That is a desirable and convenient shape, and should not have any partitions. Every 100 acre farm should have one of at least that capacity. From the foregoing data the probable cost may be easily calculated. Where lumber is cheap and the farmer does most of the teaming work, the necessary cash outlay need not exceed \$1 per ton of capacity. It will vary according to the finish of the building, the quality of lumber used, the price of material, etc. Tar paper can be purchased and put on at an expense of from 2½ to 3 cents per square yard. Fifteen tons of silage per acre may safely be reckoned on. Every two tons of well cured corn silage has a feeding value equal to one ton of ordinary hay for the production of milk or the maintenance of cattle, horses and sheep; and 100 tons of silage can be grown and cured at a total cost for rent, seed, labor, etc, not exceeding \$125.—*Extract Bulletin 42.*

Ensiling Clover.

F. G. SHORI, WISCONSIN EXPERIMENTAL STATION.

Too much cannot be said in favor of clover for the silo. There has been considerable hesitation about preserving clover in this way, chiefly, perhaps, on account of the extremely offensive ensilage which resulted from some of the first experiments in siloing clover. As in the case of the first corn ensilage, the clover was put into the silo in a watery and immature condition. The result was a watery ensilage of very offensive odor. By allowing the clover to become more mature, and cutting it when the dew is off, it is found that a bright, sweet, palatable ensilage can be made. One of the silos at the Station was filled in the summer of 1888. The clover was first grown, and owing to the drouth had become rather woody. The only precautions taken were to see that the dew was dried off before cutting, and that in filling, the clover was evenly distributed and well tramped down in the corners and along the sides. The silo was filled rapidly and immediately covered. On opening the silo the contents were found to be well preserved, with a slight aromatic odor, and but a trace of acidity. It was eagerly eaten by the cattle, and formed a valuable addition to their rations.

Profitable farming cannot be carried on without the help of this wonderful plant; we all know how difficult it is to cure into hay and get it just right, but by putting it in the silo the risk and expense of handling the crop is greatly reduced. Sunny days are not essential when putting clover into the silo. The mower can be started as soon as the dew has dried off in the morning, and by noon enough will be cut to keep two men with a team and wagon busy all the afternoon hauling the fresh cut clover and placing it in the silo. It is not necessary in putting clover into the silo to run it through a cutting machine, so that the expense of filling a silo with this crop is very light. To those who appreciate the advantage of having a succulent forage in the winter, and are willing to incur the expense of building a silo, but are restrained by the cost of the machinery necessary for reducing and elevating corn, we would say, build a silo and fill it with clover.—*Extract from Bulletin XIX.*

Poultry.

Two methods of feeding chickens were adopted by Mr. A. G. Gilbert, of the Dominion Experimental Farm, and equally good results attained from both. Part were fed with bread and milk from time of leaving the nest up to ten days, and after that with crushed corn, wheat and other grain. Another part were fed with hard-boiled eggs and bread crumbs in the early stages and soft feed afterwards, with a liberal supply of grain. All the chickens were frequently and liberally fed, and had a good grass run, with shade and insects in abundance. The chickens made rapid progress, the Plymouth Rocks showing the earliest and greatest development, weighing the 20th of January 9 lbs. ½ oz., followed by the Wyandottes with a weight of 7 lbs.; Buff Cochins, 7 lbs. 12 oz., and the Houdans, 6 lbs. 1-5 oz. The eggs supplied by Canadian breeders were found to hatch better than those furnished by breeders of the United States. The eggs supplied by the former were wrapped in paper and packed in bran, while those of the latter breeders were tightly packed in sawdust. It is thought that the turpentine contained in pine sawdust lessens the fertility of the eggs.

Common Poultry Foods.

There are three constituents, more or less, in all foods that have fixed and different purposes to perform in the animal economy. The most valuable, owing largely to its scarcity in plants, are the nitrogenous substances. These are of use in supplying material for the growth of muscles, tendons, and are contained largely in the lean meat; and in the case of fowl they are constituents that are present in the egg in large quantities. The fat is another division. The function of this is to keep up the vitality and supply warmth and in performing this office it is aided by the carbohydrates (starch, sugar, etc.) Besides furnishing heat, when this want is supplied, the fat becomes deposited on the body. Carbohydrates have little else to do than supplying the animal with warmth. The ash is a very important constituent in all food that is to be fed to poultry, as it is necessary for the formation of the shell of the egg as well as for the building up of the bone. A good general division easily understood is to call the nitrogenous substances flesh-formers, the fat and carbohydrates, fat and warmth-giving constituents, and the ash, bone-making substances. We shall adopt this in giving analysis.

Oats.—These are the best balanced of all grains, containing on an average about 12 per cent. of flesh-formers, 65 per cent. of fat and warmth-giving constituents, and 3 per cent. of ash. A noticeable feature of oats in comparison with other foods is the large

percentage of husk or fibre that they contain—namely, about 10 per cent. of the whole. When chopped or ground they make a better food than if fed whole. Oatmeal is far richer in flesh formers and fat and warmth-producing constituents, as it contains but little husk. It is, however, too expensive to feed as a rule, but it makes an excellent food for chickens and also for fattening purposes. Oatmeal consists of 15 per cent. of flesh-formers, 75 per cent. of fat and warmth-giving properties, and 2 per cent. of bone-making substances.

Barley.—This grain is one very extensively used when the price permits of this. It contains 12 per cent. of flesh-formers, 70 per cent. of fat and warmth-giving substances, and 2½ per cent. of bone constituents. Whether whole or ground, a leading poultry authority recommends this grain for rearing or egg-producing purposes. When not too expensive this food can be used to great advantage, and as a change it is to be commended even when selling well.

Corn is used, perhaps, more generally than any other, especially for fattening purposes. Of flesh-formers it contains about 10 per cent., warmth-giving and fat-producing constituents, 75 per cent., and of bone-forming substances, 1½ per cent. It may be noted that it is not a well-balanced food, as it is rich in fat, containing over 5 per cent. of this alone. It is not commendable to feed it alone, even for fattening purposes, and especially should this be observed when it is desired to produce eggs. It is claimed that the fat from fowl fed with yellow corn is of a yellowish color and hence is objected to. In cold weather it may be fed with advantage, but not in summer, as various disorders caused by internal deposits of fat are very apt to result. It is a good food, and its cheapness is largely in its favor; but it must be fed in combination with others less rich in fat and warmth-giving properties to be used without danger and to give the best results.

Buckwheat.—This grain is undoubtedly the most used in the majority of Canadian poultry yards, and it is beyond question an excellent food for laying hens. It consists of 10 per cent. of flesh-formers, 65 per cent. of warmth and fat-giving, and 2 per cent. of ash constituents. Besides being cheap, analysis and use show it to be a food of value. It is not so rich in fat-producing substances as some of the others, and for this reason is best for the layers. Buckwheat flour is not as good, as the husk, which would prevent the flour from becoming too pasty is, as a rule, removed. The following is an analysis of the flour: flesh-formers, 7 per cent.; warmth-giving and fat-producing, 77 per cent., and ash 1 per cent., while the fibre is only .34 per cent.

Wheat is very seldom used for fowls, chiefly on account of its high price in the market. It contains about 12 per cent. of flesh-formers, 75 per cent. of fat and warmth-producing, and 2 per cent. of bone-making substances. It is a good winter food, but is not useful to any extent for fattening. The wheat-screenings, however, may be profitably used. The smaller grains contain more flesh-formers than the well-developed ones, for the reason that the richest part of the kernel is the outside covering of cells; while the inner cells, which are most numerous in the large grain, consist largely of starch.

Peas and beans are rich in flesh-forming substances containing on an average about 23 per cent. of flesh-formers, about 50 per cent. of fat and warmth-giving substances, and 2½ per cent. of bone-making constituents. Best results are obtained from their use by mixing with other foods, as it will be seen that they are very rich in flesh-forming materials. They will be

found too stimulating to be fed alone, and on this account as well as for economy, should be mixed with others wanting in this respect.

These analyses are all of American grains, and their use will greatly aid in making a choice between available foods. Too great a value should not be placed upon them, as in the case of all animals, there are likes and dislikes that will in some cases over-ride figures.

FOR THE CANADIAN LIVE-STOCK AND FARM JOURNAL.

Summer Work.

BY W. C. G. PETER, ST. GEORGE POULTRY YARDS, ANGUS, ONT.

The summer work in the poultry yard is not of any extent. Hatching is over, and the main thing to look to is the successful, thrifty growth of the young stock. With this end in view, do not forget the cool, clean water, that will help the birds to keep in health and vigor. A feed of cooked rice nicely swelled, and not musty, will stop any tendency to bowel complaint and is fine feed for the young chicks. Sunflowers may yet be planted for fall use. The "Ru-sian Giant" I find the best kind; they make a fine hearty food for the stock, and seem possessed of great warmth-giving properties, hence they are a first-rate thing to use in the changeable weather of fall and early winter. They will besides give a very grateful shade for the young birds and protect them from hawks, etc. If you are not able to sow these, provide a shade of some kind, for the stock cannot thrive to its utmost while being submitted day after day to the fierce rays of the sun; and I am quite sure half of them cannot live through it if hatched late. The difference between two flocks of the same age, one provided with good shade and the other not, needs to be seen to be believed. They will not be much over half the size in the latter case, and badly feathered both for color and feathers, and will always retain that stunted look peculiar to birds that have been neglected and checked in growth. Do not wait to provide costly means of shade, if it cannot be done at once; put up old boards, or make a run of slanting lath this shape nailed to a scantling, and cover it over with brush or boughs; it makes a grateful shelter, and can often be moved to fresh ground.

As the summer leaves the poultry-keeper quite a bit of spare time, he can turn his thoughts and energies to another channel, it may be his garden or his orchard; and if he has neither of these, he certainly should possess himself of a few hives of bees. The very time he has to spare he would find all required in their pursuit, which is both profitable and pleasurable, and those portions of the day when the poultry-yard work is over, are the times when his active work lies among the bees. Apart from its profit, bee-keeping is intensely interesting, and we hope to see many add this industry to the poultry keeping.

Incubators.

EDITOR CANADIAN LIVE-STOCK AND FARM JOURNAL.

SIR,—I am in want of an incubator which will hatch from 100 to 200 chickens. As I noticed your articles in the LIVE-STOCK JOURNAL I thought you might give me some information about them, regarding the price and where I could obtain one. Having no steam apparatus, I want one that can be run with kerosene lamps. If you will kindly give me what information you can, I will be very much obliged.

VOLNEY N. DYER.

Sutton, Quebec.

ANSWER BY W. C. G. PETER, ANGUS, ONT.

You can purchase an incubator to be heated by kerosene lamps that will hold 200 eggs for \$30; it is called the "Gerred Incubator." I have worked one successfully this season. I can recommend it with

confidence. Address the Gerred Incubator Co., 98 DeGrasse street, Toronto. You will find it simple to understand and easy to regulate. There is one very important point in its management that is not explained in their book of instructions, with regard to the lamp, and that is to put the small *nick* in the top of the lamp cover over the little rise you will see in one side of the burner, so that the cut off can work easy. I will answer any questions by mail if stamp is sent for reply. I am obliged to adopt this rule on account of the numerous enquiries I receive. It is not much for twenty people to write to me daily, but it makes a big difference for one to write to twenty. Of course this does not apply to every one doing business, but merely questions not of a business character.

The Apiary.

FOR THE CANADIAN LIVE-STOCK AND FARM JOURNAL.

Swarming.

BY R. F. HOLTERMANN, BRANTFORD.

The harvest of honey and bees is at hand, or at least we shall hope so, and every one will be anxious to know the easiest method to be pursued to get the most abundant harvest. Let us first consider, does it pay to sell bees or swarms. It is not a difficult problem to find out that there is no money in selling a colony of bees in spring at \$6 or even \$7. This being the case, it will not be advisable to allow any more swarming than necessary to get the largest yield of honey. The question which intelligent bee-keepers have been interested in as deeply as any is how to prevent increase and yet secure the largest yield of honey—that is, have the bees work unremittingly and without a decrease in energy, yet prevent increase.

Artificial swarming (dividing) is now condemned by the best authorities. Breaking down queen cells is a great waste of time, often fruitless, and supposed to lessen the energy of the bees. Making the colony queenless is not desirable, as making the colony get into an abnormal condition. The very best present method is probably to shade and ventilate the hive, to give sufficient room at all times, to not allow the bees to feel sufficiently crowded to desire to swarm. Now by this latter is not intended to allow your bees to become crowded early in the season, and then later, to make up for lost time by giving an abundance of space. By such treatment the bees secure the swarming impulse early, and no ordinary amount of extra room will break the swarming impulse, and the bees go on completing queen cells and swarm. No, the bee-keeper must watch and give the room just as soon as required. With comb honey it is far more difficult to control swarming. Of course a certain amount of crowding must be done or no sections will be nicely finished. Destroying the swarming impulse by chloroforming the bees, has received some attention during the past winter through an article written by Mr. Kirby, of Oshawa. Mr. Kirby very modestly and correctly states that his experience has only been very limited in this direction, but so far as tried, has met with success. His plan is to chloroform the colonies desiring to swarm or having swarmed, and the swarms being returned, about sundown, the chloroform being applied until the bees are in such a condition that none will take wing. To destroy the swarming impulse is of course not sufficient; the consequences must not be to diminish the honey crop; and a great many tests will have to be made and general results noted in comparison with other colonies in the apiary before this method of treatment can be pronounced a preventative of swarming, and a system which in its results as to the honey crop will not prove injurious. The Ontario Agricultural and Experimental Union are conducting an experiment in this direction,

and any one wishing to conduct such an experiment can receive necessary information from me.

SHADE.

As before hinted at, a powerful factor towards the prevention of swarming and a large honey crop, would be shade. Now shade may be injurious. The hives are perhaps best under a large spreading tree, branches not lower than about five feet, and the hives circling under the outer branches, and entrance away from the trunk of the tree. So situated, the hives get early or late sun or shade through the greater part of the heat of the day, and are in the very best condition to be kept cool and sweet and dry. Of course many cannot get this shade; in such a case shade-boards may be resorted to, being large, thin boards, projecting over the sides of the ordinary cover so as to shade the top and sides of the hives.

VENTILATION.

Who has not seen the bees fanning at the entrance of the hive? By ventilating we endeavor to make a current of air pass through the hive, the cool air being drawn in at one part of the entrance and the heated out at the other. By means of ventilators the temperature of the interior of the hive can be kept down to a considerable degree and the swarming impulse prevented. The aim at cheapness rather than excellence is so strong and the demand for such goods by the bee-keeper so great that supply dealers have sought to make a cheap hive, and perhaps for this reason no special ventilators are found in hives made by dealers. There should be a ventilator in the bottom board and one again in the upper story, covered with cloth and with a button or wooden slide, so as to enable them to be covered at will.

MOVING BEES

In drawing bees to shade short distances, it must be remembered that bees will return to their old stands and not follow their hives, therefore a colony can only be drawn a few feet each time they fly. If many colonies are together and they stand close, great care must be taken or confusion will result and death to many bees trying to get into strange hives; but if a colony is isolated it can be moved quite a distance backwards each day they fly, say six or eight feet; forward or sideways, say four feet. Of course if a colony, through cold or rain, does not fly, it must be left until it does, as the idea is to allow the bees each time to note the altered position of their hives, and this cannot be done until they do fly. Long distances—three or four miles—of course makes a difference, and for all practical purposes it is considered that bees do not return that distance.

If colonies must be moved a short distance at once, put boards or some other obstruction at the entrance, so that in flying out the bees note there is a change, and most will generally re-locate themselves and return safely.

Horticultural.

THE great strain that pruning large limbs puts on the trees may be obviated by prompt attention at the present season by the rubbing off of all small buds that give promise of interlocking with other branches or destroying the symmetry of the tree. Constant attention in this respect is the price of success. The cutting of large limbs should be done in early spring when the tree is in a dormant state; but the small twigs may be rubbed off at any time without detriment to the tree. Pinching back may also be done with benefit in many cases, as the fruit resulting de-

velopes better, owing to the fact that the nourishment that goes to make a growth of wood finds its way to the fruit. Close observation in respect to the growing of the twigs and prompt action will save the worry of many a perplexing problem in pruning in after years.

It is a noticeable feature in most orchards that one year the trees bear in abundance and the following season, though the spring may be in every way as favorable as the former, the yield is meager. The only way to explain this is that the overbearing has made a drain on the vitality of the tree, and it recuperates the following year, hence the less nutriment that goes for the production of fruit. In some cases it is well to pick off the green fruit if over-bearing is liable to break any of the limbs, but as a rule judicious pruning is a sure preventive measure. A crop of apples is largely the gift of the atmosphere, very little of the substances entering into the composition of apples being derivable from the soil. But the elements contained in the wood of the tree comes principally from the soil, and for this reason requires to be put back in the soil as a manure. As wood ashes contains just those elements that a growing tree abstracts from the soil there is not another fertilizer that can be used with as much benefit as these. Unleached are worth just twice as much for this purpose as the leached. Spread them around the base of the tree within the circumference of its branches, and it will not be long until good results will follow.

INFUSIONS of some of our common plants, such as tansy (*Tanacetum vulgare*), and the root of the mandrake (*Podophyllum peltatum*) and stramonium (*Datura stramonium*), a plant belonging to the nightshade family, were experimented with by Mr. Thomas Bennett, under the direction of the Washington authorities, to determine their value as insecticides. The tansy infusion was made by putting one 1/2 lb. of the tansy in 3 quarts of boiling water, allowing to simmer an hour or two, and then setting it away to cool. The mandrake infusion was made by taking 1 lb. of the root put in a quart of water. It was heated until it began to boil, then let simmer or stew slowly for one hour. In making the stramonium infusion he took 6 oz. of the leaves and young tops of this plant and added 3 pints of water and let it draw for two hours. For the destruction of the rose aphid (*Siphonophora rosa*) and the green aphid of the peach (*Myzus persicae*) they were found effective, while extensive experiments with the cabbage cut-worm the tansy gave excellent results, for out of 1,000 young cabbage plants set out in a field known to be infested, only four out of the lot were eaten off by the cut-worm. The result of these experiments show that such substances as tomato leaves, alder bark, elder leaves, etc., are of very little use practically, while the infusions of tansy and stramonium are of value for aphides, cabbage-louse (*aphis brassicae*), the turnip fly (*Haltica*), the grape-vine thrips, and all other like insects.

Preventing Curculio Attacks on Cherries.

The best means of ridding the orchard of such a pest as the curculio is one of the vital questions of economic entomology that scientists are endeavoring to solve. This insect seems to be more liberal in its tastes than many others, as it will attack with almost equal eagerness the plum, apple and cherry. C. W. Weed, Entomologist of the Ohio Experimental Station, conducted a number of experiments last sea-

son with a view of discovering some means by which its attacks could be lessened on the cherry. London purple, and lime were the substances tried, and the success of the experiment and the importance of the question warrants us in giving it publicity. Half an acre of an orchard was used for this purpose, one quarter of the acre being treated and the rest used as a check. London purple was applied in a water spray until the trees were wet, mixed in the proportion of 1/2 lb. to 50 gallons of water. Lime was applied in a water spray mixed in the proportion of 4 quarts to 50 gallons, until the leaves whitened. The cherries were critically examined when nearly ripe, 22,500 cherries being each cut open and recorded. The conclusions drawn are as follows:

1. That three quarters the cherries liable to injury by the plum curculio can be saved by two or three applications of London purple in a water spray (in the proportion of one ounce to five gallons of water) made soon after the blossoms fall.

2. That if an interval of a month occurs between the last application and the ripening of the fruit no danger need be apprehended from its use. As a precautionary measure, it is advisable in all cases, and especially when there are few rains during this interval, that the fruit be thoroughly washed before it is used.

3. That lime is not so certain in its preventative effects as London purple, saving in these experiments only 40 per cent. of the fruit liable to injury.

Growing Spruce from Seed.

EDITOR CANADIAN LIVE-STOCK AND FARM JOURNAL.

SIR,—I have a large spruce tree growing in my yard and it is loaded with cones. There is not another spruce within a mile of it. If I plant the seeds will they grow? Please also inform me how to plant and manage them.

SUBSCRIBER.

The fact that your tree is so far distant from another of a like species does not warrant the conclusion that the seeds will not germinate through not being fertilized. For the production of seed all plants belonging to the flowering class, or phanerogams, must be fertilized, that is, the pollen produced by the stamens must come in contact with the pistils, and many are the agents that nature has enlisted in her service to perform this important work. In the case of the spruce the wind wafts these minute oval bodies called pollen from tree to tree, from flower to flower. Other plants with attractive flowers in bright colors or secreting nectar, bribe the insects to do this for them. The best criterion our correspondent can rely upon in this case is whether the seeds are plump and well developed. If so, they will germinate and grow alright, but if they are stunted the chances are strongly against their amounting to anything. If too dry from exposure, even if they have been fertilized alright, they are almost as worthless as if they had not.

If this spruce is the white variety it makes a good tree but the black is not commendable, as the branches soon die around the base. These two species are easily distinguished from the fact that the cones in the black do not drop off readily, but remain as a rule on the tree, while in the case of the white they soon fall to the ground. The seeds should be sown in moist, mellow ground, well drained and made of as fine a tilth as possible. The smallness of the seed indicates that they should just be covered and not planted deeply. By planting in rows it is much easier to keep them free from weeds. The latter should always be kept down, for if they get the start great difficulty and much annoyance will be experienced in getting rid of them. The seeds may be sown

thickly in the rows, from which they should be removed in two or three years, according to the growth they have made, to nursery rows. During the first year at least, a screen or covering to protect the young plants from the scorching midsummer sun is needed. Boards or a like covering, mounted on supports, will serve the purpose. In the nursery rows they should be planted four or five feet apart, according to size, and here trained and cultivated until they get to be five or six feet high, and begin to crowd one another, when they should be transplanted to the positions in which it is the intention to leave them permanently. Continued stirring of the soil not only keeps the weeds down, but the plants make a better growth and are not so apt to succumb to the dryness of the summer. —ED

Fungi Injurious to Farm Plants.

(Fifth Paper.)

APPLE SCAB (*Fusicladium dendriticum*).

This disease has been known for more than fifty years to be carrying on its work of destruction in the orchards of Europe, and for over half that time it has been gradually spreading in the orchards of Canada. The annual loss resulting from the attacks of this fungus, for such it truly is, amounts to an enormous sum; for not only does it lessen the sale of the fruit by defacing it, but it also materially decreases the crop in quantity by checking the growth of the young apples and destroying the assimilative power of the leaves.

It may attack the leaf, twigs or fruit, and usually affects all three where once it becomes established. For some time it was thought that the blotches on the leaves were made by a different species, but later research has disclosed the fact that they are the same. The appearance of this disease on the leaf is shown in figure 1. It is first noticeable as a small greenish spot,

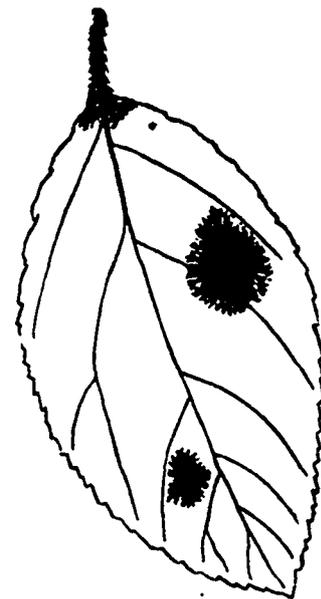


Fig. 1. (After Trelease.)

Fameuse leaf with two spots of mildew. Natural size.

which soon increases in size, growing from the centre in radiating lines. At first it has a velvety look and greenish color, which is soon supplanted by a brownish tinge when the spot becomes hard. The upper side of the leaf is most usually attacked, though it may be often noticed on the under side. This fungus does not permeate the inner tissue of the leaf or fruit as is the case of most other like diseases, but it merely penetrates through the skin, and in the cells composing the latter it rami-

fies and absorbs nourishment through its roots or mycelium. The growth of this fungus c. the leaf interferes with its normal function of assimilation from the atmosphere which, more or less, according to the severity of the attack, stunts and lessens the general growth.

Fig. 2 shows a cross section of one of the affected



Fig. 2. (After Trelease.)
Section of a spot on an affected leaf.

leaves as it appears under the microscope. The spores are usually oval in shape, and in the majority of cases one celled. A single spore (such as one of those borne on the slender stalk shown in the figure), germinating, sends out a small tube, which penetrates the tissue of the leaf, and growing rapidly, soon begins to produce new spores, and so spread the disease. How it penetrates through the hard skin of the leaf is not known, though it is now accepted that it is not necessary that the leaf be punctured by an insect to allow it to gain admittance. Prof. Budd, of Iowa Agricultural College, thinks that the degree to which this pest proves injurious is largely influenced by the leaf structure, and he makes the general statement that the apples, pears, cherries and plums of the east plain, where the seasons are hot, dry and changeable, do not scab or mildew to any serious extent, while all the fruits of the west coast of Europe do.

The growth of the scab on the fruit is exactly similar to that of the leaf. The surface of the apple is at first slightly disfigured with small spots, which soon become darker and spread rapidly, causing the fruit in many cases to crack badly. The centre of the spot soon becomes hard and dry, indicating that growth has ceased in this part, while the outer edges continue to spread.



Fig. 3. (After Trelease.)
Section through the edge of a scab on the apple. Magnified 200 diameters.

Figure 3 shows a section of a diseased spot as seen through a microscope. It will be seen that the fungus grows merely in the cells, forming the skin of the apple.

From the time that the fruit first sets it is liable to be attacked by this disease, and observers have noticed that in many cases it has spread so rapidly as to almost completely check the growth of the young apple. Mr. McD. Allan, President of the Fruit Growers' Association, is firmly of the opinion, expressed by others also, that the disease may be communicated from apple to apple in the barrel.

Though no varieties are yet known that are absolutely free from this disease, yet there are a number that are comparatively so compared to others. The Russets, Ben Davis, Maiden's Blush, Grimes' Golden, Wealthy, Rhode Island Greening, Duchess, Alexander, and Red Astrachan seem to be more capable of resisting these attacks, while the Fameuse or Snow, Northern Spy, and Baldwin appear to be more susceptible.

In respect to the remedies the first consideration is to make the conditions as unsuited as possible for its reproduction. It is noticeable that orchards on

heavy, undrained soils, suffer more than those on light soils free from stagnant water or excessive moisture. Keeping the trees well pruned so as to give the tree greater vigor of circulation, and also not allowing the orchard to suffer for want of proper manuring are important requirements. Having the conditions as healthful as possible for the trees, then recourse may be had to other measures to make the treatment more effective. It is a difficult matter to destroy the fungus after it has obtained a hold in the leaf or apple. The most effectual time of treatment being before it has gone so far. The roots or mycelium in the leaf or fruit, are hard to kill, but the spores may be prevented from germinating and spreading the trouble.

A late report of the Washington Department of Agriculture treats of this question. Simple solutions of sulphate of copper ought not to be used according to these authorities, as their use is almost certain to injure the foliage. They state that the Bordeaux mixture, made as follows, may be used at any time without fear of injury: Dissolve 16 lbs. of sulphate of copper in 22 gallons of water; in another vessel slake 30 lbs. of lime in 6 gallons of water. When the latter mixture has cooled it is slowly poured into the copper solution, care being taken to mix the fluid thoroughly by constant stirring. If it will to have this compound prepared some days before it is required for use. It should be well stirred before applying. Some have reduced the ingredients to 2 lbs. of sulphate of copper and 2 lbs. of lime to 22 gallons of water, and have obtained good results. The Washington authorities recommend the following course of procedure:

1. In early spring, before the buds have commenced to expand, spray the trees thoroughly with a solution of sulphate of iron, using 4 lbs. of the iron sulphate to 4 gallons of water.
2. As soon as the fruit has set apply the Bordeaux mixture.
3. If the weather be such as to favor the development of the scab fungus, a third application should be made two or three weeks after the second using the same materials.

The old supposed remedy of boring holes in the tree and filling them with sulphur has been forsaken, owing to the fact that it proved of no use whatever, but resulted in much damage being done to the tree.

In a bulletin of recent date the Washington authority recommends the use of "liver" of sulphur or sulphide of potassium, using the solution of the strength of $\frac{1}{2}$ oz. to the gallon of water. This should not be prepared until you are ready to make the application.

Mr. E. S. Goff, of N. Y. Experimental Station, obtained, with hyposulphate of soda, excellent results from making four applications; the first three being 1 lb. of the hyposulphate to 10 gallons of water, and the fourth reduced one half.

It is needless to say that in packing apples it is of the greatest importance to separate the spotted and diseased ones from those that are healthy and free from infection.

The Home.

Thoughts in a Garden.

BY ANDREW MARVELL.

How vainly men themselves amaze,
To win the palm, the oak, the bays,
And their incessant labors see
Crown'd from some single herb or tree,
Whose short and narrow verged shade
Does prudently their toils upbraid;
While all the flowers and trees do close
To weave the garlands of repose.

Fair quiet have I found thee here,
And Innocence, thy sister dear!
Mistaken long, I sought you then
In busy companies of men.

Your sacred plants, if here below,
Only among the plants will grow.
Society is all but rude
To this delicious solitude.

No white, nor red was ever seen
So am'rous as this lovely green.
Fond lovers, cruel as their flame,
Cut in these trees their mistress' name,
Little, alas! they know or heed,
How far these beautys her exceed!
Fair trees! where'er your barks I wound,
No name by your own be found.

When we have run our passions heat,
Love hither makes his best retreat.
The gods, who moral beauty chase,
Still in a tree did end their mace.
Apollo hunted Daphne so,
Only that she might laurel grow:
And Pan did after Syrinx speed,
Not as a nymph, but for a reed.

What wond'rous life is this I lead?
Ripe apples drop about my head.
The luscious cluster of the vine
Upon my mouth do crush their wine.
The nectarine, and curious peach,
Into my hands themselves do reach.
Stumbling on melons as I pass,
Insard' with flowers, I fall on grass.

Near while the mind, from pleasure less,
Withdraws into its happiness:
The mind, that ocean where each kind
Does straight its own resemblance find.
Yet it creates, transcending these,
For other worlds, and other seas;
Annihilating all that's made
To a green thought in a green shade.

Here at the fountain's sliding foot,
Or at some fruit tree's mossy root,
Casting the body's vest aside,
My soul into the boughs does glide,
There, like a bird, it sits and sings;
Then whets and claps its silver wings;
And till prepar'd for longer flight,
Waves in its plumes the various light.

Such was the happy garden state
While man there walk'd without a mate;
After a place so pure and sweet,
What other help could yet be meet?
But 'twas beyond a mortal's share
To wander solitary there:
Two paradises are in one
To live in paradise alone.

How well the skillful gard'ner drew
Of flowers and herbs, this dial new!
Where, from above, the milder sun
Does through a fragrant zodiac run;
And, as it works, th' industrious bee
Computes its time as well as we;
How could such sweet and wholesome hours
Be reckon'd but with herbs and flowers.

—Harper's Monthly.

Generosity.

If selfishness dwarfs, and withers, and shrivels all that is good and noble in man, generosity, which is its opposite, is rain, and sun, and earth to the best impulses of his nature. The two, like the spirits of the good and of the evil, cannot dwell together in the same bosom in harmony, for so completely antagonistic are they to one another, that they cannot come together without commotion and conflict, ending in the discomfiture of the one or the other.

Generosity is like the waters of the overflow of a spring. It goes forth in what but for their presence would be waste places of the earth, and produces loveliness and beauty and utility in all its journeyings to and fro.

It touches as with a magic wand the homes of sorrow and want, and breathes balm into their midst.

It casts its eyes upon the needy, and compassionate efforts follow. It is more God-like than pity, for where it exists, there must be active outgoings for the relief of those who come beneath its benignant glance. Show me a generous child, and I will show you a gem of beauty—beauty brighter than what is found in the coronet of kings. Show me a generous young man, and I will show you a treasure that will outweigh the wealth of a Croesus; and show me a generous old man, and I will show you golden grain more lovely than was ever gathered into earthly storehouse.

Generosity is a reservoir that never empties itself. The greater the drain, the more rapid the inflow, be-

cause its source is at once infinite and divine. Its outflow may at one time be but a little rill, which in time is likely to become a rivulet, and as its basin fills in volume, other rills flow over in different directions, till soor like waters of a fountain basin in full play, the overflow is in all directions. Wherever they come they bring healing with them, and in their outflow make the solitary places of the dreary desert fruitful as the pleasant field.

The generous man lives in a world that is very beautiful. The air he breathes is balm. The fields he tills are fresh with the odors of Eden. He is never found chasing happiness like the shadows of the bow, for it comes without his bidding. The house in which he lives is praised by all who see it, though its timbers are only rude, and it may not be embellished with any of the gold or silver of earth. He knows in himself the meaning of that pregnant statement, "It is more blessed to give than to receive," and he greatly rejoices in the gift of being, and the unnumbered opportunities it brings within his reach, to reflect again the rays of Divine goodness that constantly shine down upon him. He is greatly beloved by the orphan, and those who are pinched with want, for when he has naught else to give his kind word is a valued treasure. The widow in her mourning weeds calls him blessed, and the hoary head is always ready to give him benediction. It is true he may never accumulate the riches of this world, and yet the tower of his wealth reaches far into the skies. It is all safe, from corroding and corrupting, and business panics, which leave ruin and overthrow in their train, cannot harm it at all.

Generosity may sometimes be associated with the unreserved nature, but even then, who shall say that its origin is not divine? Even then it is a lovely remnant of primeval days that has survived in a shattered condition the rudest shock that sin ever dealt upon humanity, when man listened to the voice of the tempter and fell. In the natural man it is fitful in its operations, and constantly intermitting in its flow. The waters of its current are likely to be hindered by the debris of false reasoning, and oftentimes in the end its fountains, like a broken cistern, become completely dry. But when the wind of the Spirit that bloweth where it listeth, breathes upon the naturally generous nature and quickens it with spiritual life, it opens up afresh all the fountains of its generosity, the obstructions to the outflow of the waters are more and more removed, and they go forth, in miniature at least, like those waters of the river of life that flow "clear as crystal" for the sustenance of humanity in its sojourn both below and above the skies.

Generosity, when sanctified, is accelerated in all its movements. Its outgoings are surer and its objects more worthy, and it flows with a constancy that is unknown where the source from which it comes has not been quickened with the life-giving breath of Heaven.

Like all the graces that grow upon the spiritual tree, it is very susceptible to the improvements of human husbandry. When dug about and pruned with the human hand, its branches assume new beauty and its leaves a deeper green, and when the husbandry is both human and divine it becomes a great tree whose boughs overshadow neighborhoods and whose topmost branches tower far into the blue skies. The needy of the whole neighborhoods rest beneath its shade, and they all speak most gratefully of the goodness of the great tree of generosity that has come into their midst.

This tree never dies. The lofty cedars of Lebanon

bow their heads with age, and the grand old firs of British Columbia are broken at length by the strength of the tempest, but the tree of generosity, nurtured by hands of earth and heaven, never dies. A time comes, when, by the hands of angels, it is borne aloft into the heavens, and then, transplanted into the deep, rich soils of the hills of immortality, it continues to grow upward and outward through all the ages that a eye yet to be.

Jottings.

American Association of Nurserymen.—The 14th annual meeting of the above society is to be held at Chicago, and continue from June 5th to 6th. Reduced fares at rate of one third fare for return trip may be secured by any person, nurseryman or not, in United States or Canada, good for any train. Reduced rates are also secured at the Grand Pacific Hotel, Chicago, the headquarters of the society. This being one of the first societies devoted to this subject on the continent, a programme of high merit may be looked for. For programme and all other particulars, address the secretary, Chas. A. Green, Rochester, N. Y. This would be a pleasant trip for some of our nurserymen, and contact with their American cousins and the exchange of views would no doubt prove profitable as well.

The Silo and Ensilage.—A nicely bound pamphlet full of practical information on the above topic comes to hand through the kindness of the author, Prof. A. J. Cook, of Michigan Agricultural College. In language easily understood, the author treats of this question from the planting, cultivation, etc., of the corn to the feeding of the ensilage. In writing on filling the silo, stress is laid on the time of cutting the corn. "Never, except that an untimely frost forces us to it, fill the silo until the corn is beginning to glaze or mature enough to cut, were we cut up and husk up in the old way." It is held that by allowing the corn to mature well there is less tendency for the ensilage to become sour, and some even assert that in this lies the whole secret of sweet ensilage. Those seeking information on this important subject will find much to interest them in this book. The price, we understand, is but twenty-five cents.

Manitoba Excursions.—Mr. A. J. McMillan, special emigration commissioner of the Manitoba Government Agency, during the course of a pleasant chat on North-West affairs, informed us that there is a strong and stable boom in Manitoba this season. Settlers of the right sort are the incomers, just such as will build up the country. The above gentleman further stated that the crops were in fully three weeks earlier than former springs, and that the harvest will be in the fore part of August, if the conditions continue as favorable as heretofore. More than three times the number of settlers have taken up land than in former years, and a noticeable feature of their condition is that they come better prepared with stock, etc., to settle down and take up land at once. Those desirous of seeing this grand country, and what Canadian is not, cannot do better than take advantage of the cheap excursion rates the C. P. R. are offering for June and July. Ticket to Calgary and return is offered for \$35. See their advertisement this issue.

The Clydesdale Stud Book.—Volume III of the above book, just to hand through the kindness of the secretary, Mr. Henry Wade, of Toronto, is prefaced by a quartette of engravings that does credit to the Clydesdales in every respect. Two of the engravings have appeared in the JOURNAL, that of Granite City (5397), and St. Gatien (3988). These are both importations of Messrs. Beith & Co., of Bowmanville. The other two are from the stables of Messrs. Graham Bros., of Claremont, McQueen (5200), and MacBean (6030). It is a new feature introduced and is without doubt an excellent one. The pedigrees of 1036 animals are given, divided as follows: 345 stallions, 366 mares, and in the Scotch appendix 151 stallions and 168 mares. The editor says: "The system of registration has been strictly adhered to from the commencement, and we now take pleasure in presenting a pure Clydesdale book without a cross bred appendix. The Canadian Draught Horse Stud Book have taken the former appendices so that the Clydesdale Stud hereafter will contain nothing but pure bred Clydesdales."

Hereditary Diseases of the Horse.—As to what constitutes a hereditary disease in a horse has been a question among members of the veterinary profession and others for some time past. The council of the Royal College of Veterinary Surgeons of England, at the suggestion of the Royal Agricultural Society, took the matter in hand, and addressed circulars to 2,500 of their members. This is an expression of the opinion of the

members of the veterinary profession residing in England: "Having considered the evidence which has been laid before them, the council of the college are of the opinion that the following diseases shall be deemed a legitimate reason for disqualification. Roaring, whistling, sidebone, ringbone, navicular disease, curb, bone spavin, bog spavin, grease, shivering, cataract. The council also consider that under certain circumstances the under mentioned diseases shall be deemed to justify the rejection of an animal for breeding purposes: Splint, stringhalt, contracted feet, weak feet, bursal enlargements (such as thoroughpin and wind galls)."

Holstein-Friesian Prizes.—The Holstein-Friesian Association of America offer the following premiums for 1889: 1st. For the Holstein-Friesian cow making the best one day butter record at any State Fair, or at the Exposition to be held at Buffalo, N. Y.; Detroit, Mich.; Toronto, Can.; or at the New England or Bay State Fairs. 1st premium, \$100 and gold medal of the Holstein-Friesian Association, valued at \$50. 2d premium, \$50. 2d. For the Holstein-Friesian cow making the best one day milk record at any of the forementioned fairs. 1st premium, \$100 and gold medal of the Association, valued at \$50. 2d premium, \$50. 3d. For the Holstein-Friesian cow winning the first premium for butter in competition open to other breeds at any of the above fairs, a premium of \$50. 4th. For the Holstein-Friesian cow winning the 1st premium for milk in competition open to other breeds at any of the forementioned expositions, a premium of \$50. There are others offered, but they are confined to certain States. All premiums must be awarded by the management of the fair, and a certificate of award, signed by the president or secretary, will be required before payment of any premium will be made.

Forecast of the Year.—The bulletin issued by the Bureau of Industries, compiled by Mr. A. Blue, the secretary, is very encouraging in every respect. The reports of fall wheat are said to be the most favorable ever received since the gathering of crop statistics was commenced in Ontario. Clover is bad owing to drouth of last year, giving a poor catch. Live-stock left winter quarters in good condition, though there was a great scarcity of food. No infectious diseases whatever. Vegetation is a week or two ahead of last year. The spring frosts caught the peaches in a number of districts. The outlook for the orchard, garden and field is good so far. The spring work was begun early, and outlook for spring crops a cheering one. The only disease or pest that seems to have unopposed sway in our orchards is the black knot. Surely our orchardists will see their way clear to work in unison to accomplish the total extinction of this pest. How this may be done we have indicated in our fungi articles, in our January and February issues. Where ensilage fodder has been given a fair trial, the reports show that it has been almost invariably successful, the favorite crop being the Mammoth Southern sweet variety. Bees are reported as having wintered well. Labor, though not over plentiful, has not been scarce. The average of the province for wages was \$16.37 per month with board, and without board, \$24.28 per month.

American Association for Advancement of Science.—The authorities of the above Association have chosen Toronto as their next place of meeting, and that important body will accordingly convene in the capital of Ontario, on the 27th August next, to remain in session one week. This gathering of probably a thousand prominent scientific men will prove an interesting event for all who desire the diffusion of systematized knowledge, and its outcome cannot fail to be of benefit to the whole province. The discussion of scientific subjects, the interchange of experience, and the application of its results, must stimulate the material as well as the intellectual progress of the country. "The objects of this Association are, by periodical and migratory meetings, to promote intercourse between those who are cultivating science in different parts of America, to give a stronger and more general impulse and more systematic direction to scientific research, and to procure for the labors of scientific men increased facilities and a wider usefulness." Chemistry, Physics, Mathematics and Astronomy, Mechanical Science, History, Geology and Geography, Biology, Anthropology, Histology and Microscopy, Economic Science and Statistics are among the subjects to be discussed, in different sections of the Association, during the week that it continues in session.

Northern Clydesdales in Canada.—Northern-bred Clydesdales have of late been coming well to the front in various of the Canadian showyards. At the recent show at Toronto, there was very strong competition amongst draught horses. As we noted some time ago, St. Gatien and Bounding Willow, two recent exportations, were first and second in the aged class, but these horses were closely pressed by Lord Lie

tenant, a massive five-year-old bay exported by Mr. Johnston, Greenwood, and bred at Collie, Fochabers, out of Mr. Sutor's famous mare Rosebud, dam of his well known stud-horse, Strathpey, which has lately been added to Mr. Peter Crawford's stud. At the stallion show at Bottineau, Dakota, on the 6th inst., northern-bred horses practically cleared the board in the heavy section. Grangetown, a thick, compact, four-year-old chestnut with the best of legs and feet, bred by Mr. Ingram, Rothiemay, was a popular first. This horse as a foal won the first and special at Keith. Second honors were won by Aven-side, a four-year-old, by Laird of Urie, bred by Mr. Reid, Tom-breck Ballindalloch. St. Andrew, rising three-year-old, by Straphesey, bred by Mr. R. Mull, Collie, Elgin, was fourth, while Victor Prince, bred by Mr. Annand, Newton, Spey-mouth, made a good fifth. Grangetown, Aven-side, and St. Andrew are the property of Sutor Brothers, Bottineau—*North British Agriculturist*.

Harvesting Machinery.—Up to a date not long past, the United States was accorded all the credit of leading the procession in the march of improvement in harvesting machinery, and the popular idea in Canada seemed to be that anything "Yankee" was, consequently, of superior merit. During the last few years, however, this mistaken impression has been gradually dispelled from the minds of intelligent people, for it is being demonstrated that in the manufacture of mowers, reapers and self-binding harvesters, Canada stands in the proud position of being second to none. Especially is this true of Messrs. A. Harris, Son & Co. Ltd., of Brantford who are the largest manufacturers in their line in Canada. Their machines have not only attained the highest place in Canada, but have attracted the attention of many American manufacturers. We are informed that they have shipped many parts of their light steel binder to U. S. makers, have sold some of their patents to one of the largest, if not the largest, manufacturer in that country, and that many of the valuable improvements first introduced by them are now being used on many machines in the grain fields of the Republic. Messrs. A. Harris, Son & Co., Ltd., are the pioneer binder manufacturers of Canada, and have gained their present high position in many years of careful study of the wants of their patrons. They have not been contented with simply following their American brethren, but have been marching side by side with them and successfully competing with them in foreign markets. Their immense factory at Brantford is now turning out fifty complete binders and mowers a day, and a visitor passing through the packing department in the latter part of April would have seen where many of these celebrated machines go. Besides the immense number of shipments to supply their home trade, the following foreign consignments were being packed: 15 carloads for Argentine Republic, S. A.; 10 carloads for New Zealand; 2 carloads for Australia; 3 carloads for France; 1 carload for Scotland. Their shipments to Manitoba up to date exceed 210 carloads, and before the harvest is over in that Province will exceed 200 carloads. Thus it will be seen that Brantford machines have proved their worth in every country where they have been introduced and in competition with every machine of consequence in the world. More judgment should be exercised in selecting a self-binder than in purchasing any other implement, for a day's time lost in harvest may cause the loss of many dollars besides a great deal of annoyance and trouble. No mistake can be made in buying a Brantford machine.

An implement indicative of progressive farming is Wilson's Hay Loader, manufactured by Mr. Wilson & Co., of Hamilton, Ont. As an agent for the lessening of the chances of damage to the hay crop, too much cannot be said in its favor. This firm has been for some time handling this implement, and the coming season gives every indication of a strong demand, the outcome of past experience for this necessary adjunct of successful hay making. See advertisement elsewhere.

A good cultivator is one of the most useful implements that is used in Canadian farm practice, not only because of its value for freeing the soil of weeds and lessening drought, but a soil in good health becomes richer from nutriment gained from the atmosphere. The Queen cultivator is manufactured by Copp Bros., of Hamilton, Ont. An advertisement appearing on another page fully sets forth the individual merits of this implement.

Messrs. J. F. Miller & Sons, of Morrisburg, Ont., have made a change in their regular advertisement and now desire to draw attention to their Warrior mower. For simplicity of mechanism, lightness of draft, and strength of construction they claim for it a first place. Those desiring a mower for the coming season would do well to make inquiries of this firm before supplying their wants elsewhere.

Mica roofing bids fair to supplant shingles for roofing purposes owing to the superiority of the former in many respects. It has cheapness directly and indirectly on its side, besides possessing the additional advantages of being impervious to water, and fire proof. It is manufactured by the Hamilton Mica Roofing Co. They also manufacture mica paint, a preparation for which much is claimed, for painting and repairing leaky roofs. See their advertisement in this number. All inquiries will be gladly answered. Their office address is 103 James st. north, Hamilton, Ont.

Stock Notes.

Parties forwarding stock notes for publication will please condense as much as possible. If written separate from other matter, it will save much labor in the office. No stock notes can be inserted that do not reach the office by the 23d of the month preceding the issue for which they are intended.

Horses.

Mr. Stewart, Howick, Chateaugay Co., Que., importer of Clydesdales, writes us expressing thanks for the valuable aid he has received from his advertisement placed in our columns, and also states that he has sold to Messrs. D. & D. McMaster, of

Advertising Rates.

The rate for single insertion is 18c. per line. Nonpareil (12 lines make one inch); for three insertions, 15c. per line each insertion; for six insertions, 12c. per line each insertion; for one year, 10c. per line each insertion. Cards in Breeders' Directories, not more than five lines, \$1.50 per line per annum. No advertisement inserted for less than 75 cents. Contracts broken by bankruptcy or otherwise, shall revert to the regular rate of 18c. per line.

Copy for advertisement should reach us before the 25th of each month (earlier if possible). If later, it may be in time for insertion, but often too late for proper classification. Advertisers not known at office will remit cash in advance. Further information will be given if desired.



ECONOMICAL WOMEN

should have one or both of these adds to cheap comfort.

THE DOWSWELL WASHER

THE STANDARD WRINGER

save the Clothes, the Health, Time, Money Sold by Hardware Dealers, or direct from Standard Mfg Co. 34 James n. Hamilton.

SILVER Wyandotte and Pekin Bantam fowls, Cocker Spaniel and Fox Terrier Dogs. Address Rideau Kennels, 467 Rideau St., Ottawa.

RICHARD DELBRIDGE, Winchelsea, Ont., breeder of pure Berkshire pigs. Young stock for sale. Registered pedigree. Price right.

W. W. SEELEY, Green Valley, Ill., U. S. A., breeder of Improved Chester White Swine. Pigs from prize-winners at lead & State fairs and others for sale. Satisfaction guaranteed. Write for prices.

IMPORTED AND CANADIAN-BRED SHROPSHIRE SHEEP For sale, registered pedigrees. Agent for Dana's Sheep and Cattle Labels. **INO DUNKIN**, Brucefield, Ont. mar-1

FOR SALE
6 CHOICE YOUNG SHORTHORN BULLS and a fine lot of Berkshires, very, very **CHEAP**. Send for prices. **EDWARD JEFFS**, Bond Head, Ont. ja-

SUFFOLK and BERKSHIRE PIGS
6 weeks old, \$5 each. Bred from imported stock. Eligible to register. Order at once. **F. J. RAMSEY**, Moultondale Stock Farm, Dunnville, Ont. my-1

FOR SALE—The stock bull, **BRITISH SOVEREIGN**, a pure Mantilini Booth, 4 years old, for three years at the head of the River side herd, Woodburn. He is a grandson of the great Sir Simeon, red in color, and has proved himself an exceedingly fine stock getter. Will be sold cheap. **THOMAS SHAW, GUELPH, Ont.**

PONIES FOR SALE.

One dark brown, 13.3 hands, 700 lbs., from T. B. mare and half Arab stallion. One light brown, 13 hands, 600 lbs., from a minute trotting Exmoor pony mare, and a 14½ hands, Phil Sheridan stallion, 240. Both very kind and nicely broken to saddle. Address,

JAMES NOODIE, Eschol Grove Stock Farm, Dec. 15. **CHESTERVILLE P. O., Dundas Co., Ont.**

Shorthorn Bulls

1 bull, aged 5 years; 1 bull, aged 19 months; 1 bull, aged 14 months; 1 bull, aged 12 months. All of Dom. S. H. B. registry, except the bull aged 19 mos., which is eligible to N. S. H. B.

A. C. BELL, Troutbrook Farm, New Glasgow, N. S.

BOYS FOR FARM HELP!

The managers of **DR. BARNARDO'S HOMES** desire to obtain good situations with farmers throughout the country for the boys they are sending out from time to time from their London Homes. There are at present nearly 3000 children in these Homes, receiving an industrial training and education, to fit them for positions of usefulness in life, and those who are sent to Canada will be selected with the utmost care, with a view to their moral and physical suitability for Canadian farm life. Farmers requiring such help are invited to apply to

MR. ALFRED B. OWEN,
AGENT, DR. BARNARDO'S HOMES,
204 Farley Avenue, Toronto.

GERMAN CARP

Last year's fry, at \$3.00 per 100, or \$20.00 per 1000. **NICOL & SONS**, Catarqui, Ont.

Laggin, Lancaster Co., Ont., the well-known prize winner Duncan Bruce (6701). This horse was bred by And. Bruce, Jordanstown Meigle, and was sired by Morning Star (307), dam Jordanstown Jean (15), by Young Baronet (19). Messrs. McMaster, who are owners of large farms and leading stock raisers, were very desirous of securing a superior horse, having gone to considerable trouble in visiting many of the leading stables, but the final purchase of such a horse as this has well repaid them for their pains. These gentlemen are to be congratulated on securing a brother of the well-known Pickwick, and it is our hope that they may realize as much from him as the former commanded at Chicago. A new importation to the stables of Mr. Stewart, consisting of a number of fine stallions and fillies, will shortly arrive, selected by the expert who sent out Robert Bruce.

Mr. Wm. Maharey of Russell Co. has a number of excellent Clydesdale horses at present in his stud. Admiral Edmonton (2551) is an importation of 1884, a rich dapple brown, with star on forehead and white hind feet. He was bred by John Rennie, Allanfauld, Stirlingshire. His sire was Rajah (1274), a son of Royal Prince (732), a get of the world famous Prince of Wales (673). Rajah was sold to go to Australia for £1,000, and his gr. dam Nancy was sold in Scotland for £500. The dam of Admiral Edmonton was Allanfauld Nancy (2849) by Largs Jock (444). A low blocky horse is Admiral Edmonton, with splendid underpinning, fringed with silky hair. He is of docile disposition, with plenty of activity, and has proved himself to be a thrower of grand stock. In July and August, 1888, visits were again made to Scotland, and a good selection was made of a couple of growthy youngsters that give indications of proving valuable sires. St. Locher 6263 is a foal of 1885, of a deep bay color, ratch on face and three white feet. He was bred by Jas. White, Renfrewshire. Benmore 1048 was his sire, and Jessie Lang 5147 was his dam. Lord Lyon 489 was the sire of his grand-dam. St. Locher stands over 16 hands high, and has a very massive shoulder and full prominent chest and a kindly eye. His feet and bone are excellent, and body deep and round. His action is like clock work, and stride lengthy notwithstanding his heavy weight. British Pearl (Vol. XI), his companion, was bred by Robt. Aitken of Argyllshire, and is a foal of 1889. Sire, Cairngorm Riddles (Vol. XI), dam, Jean (Vol. XI); sire of dam, Prince Royal (649) by the Prince of Wales (673). British Pearl promises much though yet young. He has the best of flat legs, with excellent feather, with a roomy body, giving good heart girth, and a nicely chiselled neck and clear defined head, very indicative of quality in every respect. Mr. Maharey has every reason to be proud of his stud, and the result of their use must soon have a very beneficial permanent effect on the stock of the neighborhood.

We have been favored with the catalogue of the Redbank Stock Farm, Upper Lachine Road, near Montreal, of which Mr. T. H. Love is the proprietor, and Mr. Wm. McBride the superintendent. Standard-bred trotting stock, thoroughbreds and Clydesdales are well represented at this stud. The former number in the ranks, Kentucky Prince Jr. 1339, a chestnut, foaled 1874, 16 hands high and weighing 1200 lbs. He sired J. G. 27 ½ as a 6-year-old. The engraving accompanying the catalogue shows him to be a tall, rangy horse, with plenty of ambition, one that could be patronized liberally by the most particular of horsemen. He is a son of Kentucky Prince (2470), who trotted a public trial at Fleetwood in 2.28, and sired such horses as Bayonne Prince, 2.21 ½; Spofford, 2.19 ½ at 6 years; Guy, public trial 2.20, and many other noted foot performers. Clark's Chief (89) was the sire of Kentucky Prince (2470), who also sired Croix, 2.19 ½; Woodford Chief, 2.22 ½ at 5 years, and 5 others in the 2.20 list. Clark's Chief was got by the great Mambrino Chief (11), he by Mambrino Paymaster, son of Mambrino, he by imported Messenger. On his dam's side, Kentucky Chief is excellently bred. 1st dam Patchen, by the noted Mambrino Patchen, full brother of Lady Thorne 2.18 ½. Mambrino Chief has at least 17 sons and daughters in the 2.20 list, and 22 grandsons and daughters in the same class. The dams of Rosa Wilkes, 2.18 ½; of Elvira, 2.18 ½; Guy Wilkes, as well as many other famous sires, and g. g. sire of Patron, 2.24 ½ at 5 years, and now standing at \$300 for the season. The other standard-breds are Tom Walkmill, sired by Sir Walkmill, by Rysdyk's Hambletonion (10); Lottie K, record 2.27, sired by American Emperor Jr.; Bella D, \$100,000 was refused for Vounette, the dam of this mare; Miss Morley, sired by Victor, record 2.29 ½; Hathorn, sired by Aristos (771), record 2.27 ½; Julia D, sired by Kentucky Jr.; Jean S, sired by Lishas Kill, dam Middletown Belle. Raven heads the thorough-bred list. He is a horse of many personal qualities, which he has given proof of on the course, having won many races. He stands 15 ½ hands high and weighs 1100 lbs. He is of the richest of breeding. A number of thorough-bred mares are also kept. Wee Shand, Vol. 9, a Clydesdale stallion foal of 1884, was sired by British Commander (1981) Vol. 5, 1st dam Kate, by St. Colones (736), Vol. 1; and dam Kate, by Star (834), Vol. 1.

The stud at Hillside, Russell Co., the property of Wm. Eadie, is one of the oldest in Ontario. The first horse imported was Young Campsie Jock (5438), an importation of 1872. He was bred by Jas. Scott, Lanarkshire, Scotland, and was sired by Young Campsie (929), dam Jess. This horse did a grand work in his life of 24 years in improving the stock of that county, and the effect of his patronage is yet discernible. The next to be brought to the stud was Wellington, but he did not remain long, being sold for a good price to do good service in Huron Co. Jess (536) was the next importation, a dark brown matrionly mare, bred by Jno. Patton, Renfrew. Her sire was Baron Renfrew (1599), dam Lily of Renfrew (2804). This mare with foal at foot won, in good company, 1st prize at Ottawa Provincial, as well as many other prizes at local shows. Her foals, five in number, have been reserved for breeding and farm purposes, with exception of two that unfortunately died when about to be shipped to California. He was never beaten in the show-ring, and was a grandson of Druid 1200. W. C. Edwards, M. P., of Rockland, secured one of them to head an excellent stud of mares. Colquhoun (3956), sire of Honest Willie, was also an importation of late years, but just a short time ago sent to California. He is a well furnished horse and has given in the past a good account of himself. My Lord (4592), another member of this excellent stud, was purchased from Taylor and Percy of Markham. He was bred by Jno. Kerr, of Swanraer, his sire being the noted show horse, Blue Ribbon (107). He has

thrown excellent stock. Jean, a daughter of the renowned Prince of Wales (673), is a massive rooney mare, weighing in the neighborhood of a ton. She is in foal to a grand stock horse, Stansfield (7283), a late arrival at these stables, bought from Peter Ferguson, Renfrew. At the same time a group of Shetland ponies were brought over; one stallion and three mares, most of which have been disposed of. Stansfield 7282 is a brown, sired by Sir Frederick 2774. This horse possesses many excellent qualities nicely balanced and well proportioned in every way. A grand stallion foal, sired by Windsor, owned by Mr. Clarke, completes the list. This stud is the home of many excellent horses that are doing much to improve the stock of the surrounding districts.

Shorthorns.

Mr W J Higgins, of Elmhurst Farm, Clinton, Ont., writes us as follows. "Since writing you last month I have sold the eight months old calf Royal Celt = 10788 =, sired by imp. Excelsior (5123), dam Isabella Broughton = 15842 =, by Favorite, etc. Mr. John W. McDonald, of Porter's Hill, Ont., is the purchaser. Royal Celt was the remaining one of my last year's crop of bull calves and I think will make a good, useful animal."

Messrs. F. Lowell & Son, West Montrose Stock Farm, write as follows: "We have just sold to Mr. R. Rivers & Son, of Spring Hill Stock Farm, Walkerton, Ont., the Seraphina yearling bull Silver King 4th, calved December 20th, 1887, deep red and white marks, to place at the head of their herd of Shorthorns. He is sired by Waterloo Duke 12th, bred at Bow Park, Brantford, Ont.; a son of 4th Duke of Clarence, dam Lowell's Seraphina 2d, by 15th Seraph = 3854 =, g. dam Lowell's Seraphina 2nd, by Count Blismark = 1557 =, a son of imported Knight of St. George (26544) = 145 =, formerly owned by the late Hon. D. Christie, Paris, Ont., and has won at all our local shows. He will make, I hope, quite an acquisition to the herd. This is the fifth bull we have sold within a short time."

Messrs. E. Gaunt & Son, of St. Helens, write us: "Our stock have come through the winter in good shape. Our cows have given us another fine crop of calves from our well known stock bull Lord Lovell = 2030 =. His calves are like himself, natural fleshers, smooth, stylish and large. The demand for young bulls of his get far exceeds the supply. Although we paid a long price for him some years ago, we regard it as a good investment. There seems to be an increasing demand for a better class of bulls, as evidenced by the recent sales in Britain and the United States, anything of extra merit being picked up at good prices, while the inferior or pedigreed scrub is not wanted at any price. We are pleased to see increasing interest manifested in the milking qualities of Shorthorns. It is a popular error that Shorthorns are of no use for milk. We would like to place some of our cows against some of their noted dairy specialties, and we have no fear of the Shorthorns suffering in the test. We have made sales of Shorthorns as follows: B. C. Lord Lonsdale, to D. Thomson, Iona, B. C. Lord Clarendon, to W. Durmin, St. Helens; B. C. Lord Elcho and two heifer calves to R. Corley, Ilkgrave; to Jas. Crowston, Langside, one cow. Our sales of Leicesters have been too many to enumerate in detail. We had a good demand and got fair prices, which means that all the different breeds of downs combined have been unable as yet to annihilate the old tried and true Leicester, the Shorthorn of sheep."

In reference to the recent sales at Dexter Park of the consignments of the Bow Park Farm, of Brantford, and of Mr. Hunter, Alma, the *Breeder's Gazette* says: "The cattle were sent forward in nice condition as a whole, and in many cases individual merit of a high order was combined with pedigrees which in the past have commanded much higher prices, but the attendance was at no time large nor was the bidding active. The only sensational price of the week was made by the 4th Duke of Clarence, Oxford cow, offered from Bow Park, for which Mr. Homer Brooks paid \$2500." The following are some of the prices: Duchess of Oxford 26th, red, calved Jan. 2d, 1885, \$2500; Lord Underly Barrington 6th 52012, red, calved July 2d, 1885, \$600; imp. Buchbury Countess of Kirklevington 7th, red, calved May, 1884, \$280; Roan Duchess 4th, red, calved April, 1887, \$755; Waterloo 54th, red roan, calved April, 1883, \$265; Kirklevington Duchess 40th, red and white, calved 12th July, 1887, \$900; Roan Duchess 26th, red, calved Mar 31st, 1883, and c. c., 1885; Geraldine 4th, red, calved Mar., 1886, and b. c., \$170; Waterloo 56th, roan, calved Mar., 1886, \$160; Lady's Queen 2d, roan, calved Dec., 1887, \$155; Duke of Oxford 57th, white, calved May 1883, \$145; Lord Woodbine 2d, roan, calved Oct., 1886, \$140; Duke of Kirklevington 28th, red roan, calved Sept., 1883, and c. c., \$130. Thirty females, according to our contemporary, sold for \$6,220, an average of \$207.33; 12 bulls sold for \$2060, an average of \$171.66, and the forty animals sold for \$8250, average \$171.50.

Mr. Jas. S. Smith, Maple Lodge Stock Farm, Maple Lodge, Ont., writes us as follows: "Our stock are all doing nicely and we do not think they were ever in better or more thrifty shape. Our sheep are doing exceptionally well; lambs large for their age and going right ahead. We have some very fine young Berkshires also. Every kind of crop is growing rapidly, and grass in abundance for everything. Since our public sale in March, we have made the following private sales of Shorthorns. The young bull Royal Barrington 4th = 11642 =, to J. W. Murphy, Cass City, Mich. He is a very choice young bull, and together with the cow, Rose of Autumn, and calf purchased at our sale on 28th March last, will make a nice start for a herd. To D. McKay, Owen Sound, we sold a grand 4-year-old rich roan cow Tulip's Duchess 6th, and the red heifer calf Tulip's Duchess 12th, got by Sir Arthur Ingram 2d, a half brother to Bow Park's great show bull of that name. The cow is rich with the best Bates blood, got by Earl of Goodness 5th = 593 =, he by the celebrated 4th Duke of Clarence (13597), dam by 2d Duke of Rutland = 1690 =, by 2nd Duke of Airdrie = 500 =, g. dam by 2nd Duke of Airdrie = 500 =, etc. Her family (Lily, by Warden (156), have produced many extraordinary milkers. To Harry Johnson, Leury, Ont., the calf Eleventh Prince of Thurl, an extra good calf, short legged and thick all through, a dark roan with a long mossy coat of hair. He was got by Duke of Colchester = 928 =, dam by Baron Constance 5th = 178 =. Of Leicester sheep we have sold to Judson Wells, Ohio, U. S., 3 fine breeding ewes and 1 shearing ram; to Mr. J. Hall, Wisconsin, U. S., 1 shearing ram. We have recently sold our old stock bull Duke of Colonus = 928 = to

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ST. THOMAS, ONT

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See page 137 for further information.

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Mr. Walter Lynch, Westbourne, Man. He is one of the very best bred bulls in the Dominion, and besides being a grand individual animal, has been the best sire that we have ever used in our herd, and has left us a splendid lot of young things. Notwithstanding the great excellence of Mr. Lynch's herd, (one of the largest in Canada) I predict that he will work a decided improvement there. To succeed him in our own herd we have secured Conqueror, from Mr. John Dryden. He is a Cruickshank bred bull, and of the genuine north country stamp. His good breeding amounts to anything—and we firmly believe in it, where, as in the case of Conqueror, the animal is right—then we should get some very choice things from him.

Holsteins.

Maid of Netherland, a Holstein recently brought from Cuba, N. Y., by A. & G. Rice, Currie's Crossing, has dropped a handsome heifer calf which was sired by Pieterje 2d's Holland King, one of the greatest sires in the world, whose dam Pieterje 2d, has the largest milk record ever made. What makes it of special interest is that this young animal is the first and only descendant of the world famous family in Canada, which is so highly esteemed in the States as to command \$500 service fee per cow this year for this great sire.

Galloways.

Mr. Wm. Martin, of Hope Farm, St. Jean Baptiste, Man., reports his herd of Galloways in splendid condition after winter. He writes us that inquiries for this valuable breed are increasing among the intelligent farmers of Manitoba, who see the value of breeding stock which have at least three advantages which no other stock possess: great hardiness of constitution, combined with great beefing capabilities; absence of horns, so much desired by all breeders; a skin which is, when tanned, worth \$25. The demand for yearling bulls is quite in excess of the present supply.

Aberdeen-Angus

The Allan liner *Sarnatian*, says the *North British Agriculturist*, which sailed from the Clyde for Quebec on Friday, had on board one of the largest drafts of Aberdeen-Angus cattle that has probably ever left this country at one time. The shipment, which consisted of six bulls and ninety-two heifers, was consigned by Mr. Walter F. C. Gordon-Cumming, Aityre, Forres, and their ultimate destination is, we understand, the Quorn Rancho, Calgary, Alberta, Canada. The cattle, which are representative of all the best strains of blood in the breed, were mostly selected in the north of Scotland, though a few lots were picked up from Mr. Clement Stephenson and others who breed outside the original home of the breed. The work of selection was done on behalf of Mr. Gordon-Cumming, by Mr. Robt. Walker, Aityre, and Mr. Jas. Smith, Mullochard, Glenlivet, and the shipment of the stock on Friday was superintended by Mr. Walker. Of the ninety-two heifers, seven were selected from the Aityre herd of Sir Wm. Gordon-Cumming, and the families represented include the Prides of Aberdeen, Mulben Mayflowers, and Westertown Roses.

Jerseys.

The recent sale at New York of the best of the noted herd of Oak lands, late the property of V. E. Fuller, was well attended, bidding brisk and the following are some of the prices realized, indicating that the Jersey by no means wants for friends: Marianne Poggis, 7 years, A. B. Darling, Ramsey, N. J., \$2300; Mary Anne of St. Lambert, 10 years old, T. A. Havemeyer, Mahwah, N. J., \$2100; Mermaid of St. Lambert, 10 years, T. A. Havemeyer, \$1900; In-and-In bred Bull, 1 year, A. H. Moore, Philadelphia, Pa., \$1700; Marianne's John Bull, 1 year, T. A. Havemeyer, \$1100; Canna Daisy of St. Lambert, 1 year, F. Billings, Woodstock, Vt., \$775; Canada's John Bull, 7 years, T. A. Havemeyer, \$750; Stoke Poggis John Bull, 7 months, T. A. Havemeyer, \$710; Mermaid of St. Lambert II, 4 years, F. Billings, \$650; Marianne Poggis' son, 3 months, Wm. Whiting, Holyoke, Mass., \$625; Crocus' Stoke Poggis bull, 4 months, Mr. Thompson, Bernardsville, N. J., \$400; Call Him Fine, 1 year, G. L. Baker, Land's Point, \$400. The twenty-nine animals sold averaged slightly over \$603 per head.

Sheep and Pigs.

W. H. Cockburn, Aberfoyle, Ont., writes us: "My flock of Shropshires are doing excellent. The ram lamb Victor, purchased from Prof. Shaw, formerly of Woodburn, now O. A. College, Guelph, weighed at ten months old 150 lbs. I have some very strong, promising lambs from him. All are recorded in American Shrop Record. I have made some splendid sales of fowls through my advertisement in the JOURNAL. Have also purchased some superior Black Leghorns and Light Brahmas lately. Chick's number over one hundred."

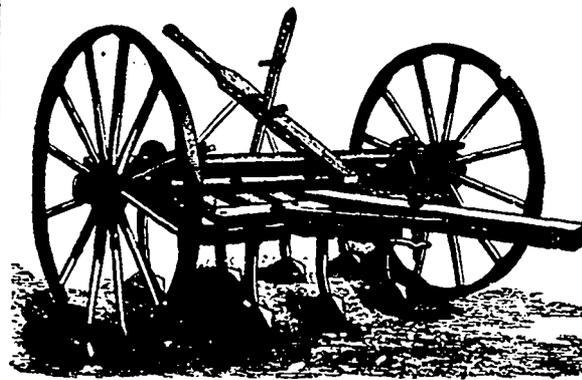
J. Campbell, jr., of Fairview Farm, Woodville, Ont., reports an active and growing demand for the better quality of Shrops. In May he sent a choice, uniform lot of 6 shearing ewes and ram to B. Gates, Mt. Lebanon, N. Y.; a first class imported shearing ram to E. A. Bailey, Winthrop Centre, Maine. Booked an order for 13 rams and six ewes—Canadian bred—for August delivery to Messrs. Mathewson, Dakota, and one for an imported lot for H. C. Pratt, Canandaigua, N. Y., besides orders for small lots of imported sheep for Canadian breeders. Several orders for good breeding and show stock from Americans could not at present be filled, so Mr. C. left for England the last of May with a view to bringing back a number of sheep to supply the demand and replenish his flock.

Mr. W. W. Seeley, of Green Valley, Ill., U. S., breeder of imported Chester White swine, places his card in our Breeder's Directory. Mr. Seeley has a herd that has won for him considerable renown, owing to their many prizewinnings. He reports as late sales a fall show pig and sow to A. B. Lucas, banker, of Castalia, Dak.; a trio pigs to Butte City, Montana; two pair to different parties in Iowa, and lastly the yearling show boar Zuratti, Vol. III, sired by that great first-prize and sweepstakes boar Sample 711, to W. C. Vandercook, Cherry Valley, Ill. His sons have saved the good average of eight pigs, a number of which were mated for the special purpose of producing show pigs, and whose pigs are now proving as their prize breeding would indicate.

Mr. C. T. Garbutt, Claremont, Ont., writes to say that his silver medal herd of Berkshires never were in better form than

at the present time, the young stock farrowed up to date being 14 sows and 7 boars. He has made the following sales since the fall shows: Jno. Thompson, Scott, 1 boar; J. C. King, Uxbridge, 1 boar; Thos. Burnham, Langford, 1 sow; Wm. Garbutt, Arnott, 1 boar; G. E. Curtice, Bluevale, 1 boar; Jas. Burton, Greenbank, 1 sow; W. L. Masson, 1 imp. boar, Columbus; T. L. Salter, Greenbank, 1 sow; Thos. Johnson, Uxbridge, 1 sow; Wm. Powell, Claremont, 2 sows; Sinclair Holden, Balsam, 1 boar and sow; Jonas Proctor, Glen Carin, 1 boar, and made sale of 1 boar to Manitoba; George Wagg, Goodwood, 2 sows; A. S. Collins, Uxbridge, 2 sows; Frank Derusha, Claremont, 1 sow; Jos. Slack, Claremont, 1 boar; D. S. McFarlane, Claremont, 1 sow. C. T. Garbutt was very successful as an exhibitor in 1888, having taken with stock, 45 firsts, 14 seconds, 1 third, including diploma and silver medal. His Berks are of a large strain, and registered, and two of the sows are imported.

Two years and a half ago, Mr. Andrew Whitelaw, Guelph, Ontario, purchased privately a pen of "short" gimmers from Lord Polwarth's flock at Mertoun, as well as a shearing ram each, at the Kelso Ram Sales, from the lots of Mr. Jack, Crichton Mains, and Mr. Dodds, Dunstan Square, the latter being by a Mertoun ram, by Mr. Torrance's 2165 ram, from an old Smith ewe. The Crichton Mains shearing was by Champion Davie, which again was by Mertoun Davie, out of a Prince Albert ewe, while Mertoun Davie (which never left Mertoun) was by Old Davie, the Bailieknock 2155 sheep. Writing to a friend on the Borders, under date Guelph, March 17th, Mr. Whitelaw states: "Out of the five ewes and two rams that I imported, we have still six left. We lost one of the ewes yesterday over lambing, but as we had a very fine ewe lamb off her last year, and another one this season, we will not lose anything, as I consider her last year's lamb worth as much, if not more, than I paid for her. We have now seven lambs off the ewes, and one is yet to lamb. Last year we raised five very fine ewe lambs and one ram lamb off the five, so you see we are having pretty good luck. Both the rams have done well, and are looking capital just now. The Dodds sheep is a monster, and if nothing happens to him, he will not be easily beaten at the shows next fall. His stock being large-framed, and heavily woolled, suit Canadian breeders. The Jack sheep, though not so large, excels him in some respects, while his stock are very full of quality. About a week ago I was travelling on the railway, and when I came to Shakespeare Station, I made up my mind to jump off and see how Mr. Kelly was getting on. He has still the ram he bought from Lord Polwarth, and although he is not what you would call a first-rate show sheep, still Mr. Kelly is well satisfied with his stock. The four ewes he got from Mertoun are all alive yet. They have turned out splendidly, having grown into fine big sheep." Mr. Kelly purchased his lot exactly three years ago. His Mertoun ram was by The Duke, out of a Haymount ewe.—*London Live-Stock Journal*



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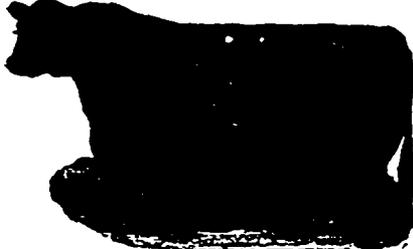


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I can supply intending exhibitors with first-class show animals of either sex and of various ages, from calves upwards.

I have also a good lot of imported CLYDESDALE STALLIONS and MARES for sale. Claremont Station, C. P. R., or Pickering Station, G. T. R. Write or wire me, when and at which station to meet you. Send for catalogue. No business, no harm.

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Mower made. The Warrior has 2 1/4 inch sections, making it impossible to stone the knives.

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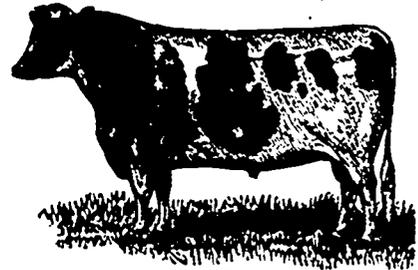


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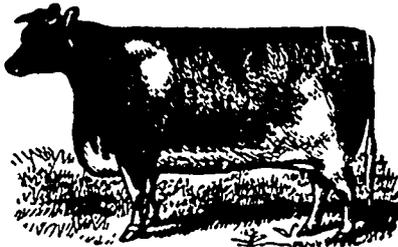


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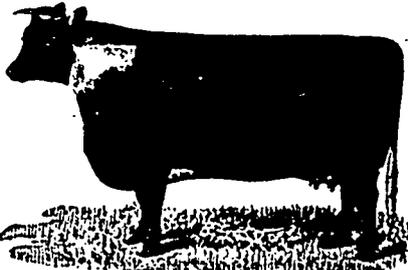


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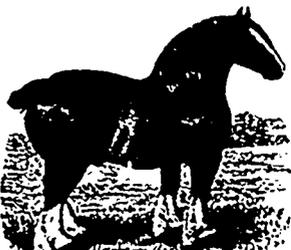
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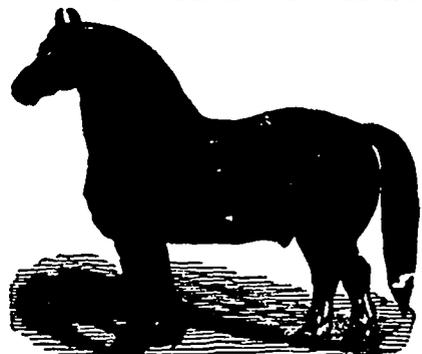
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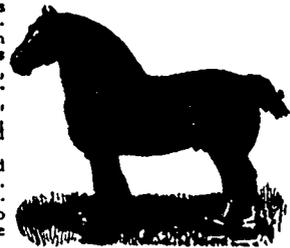
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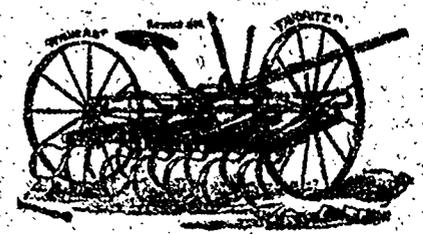
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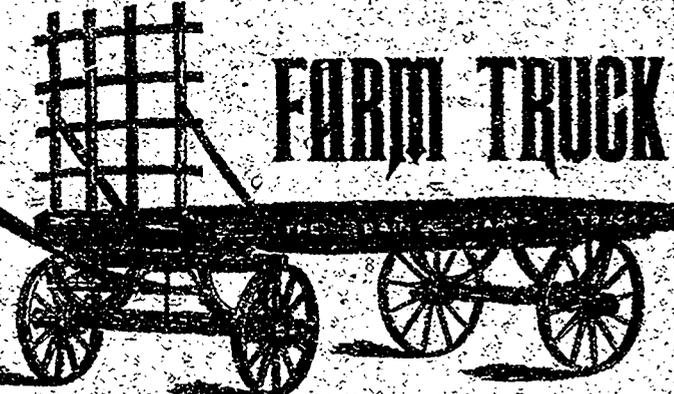
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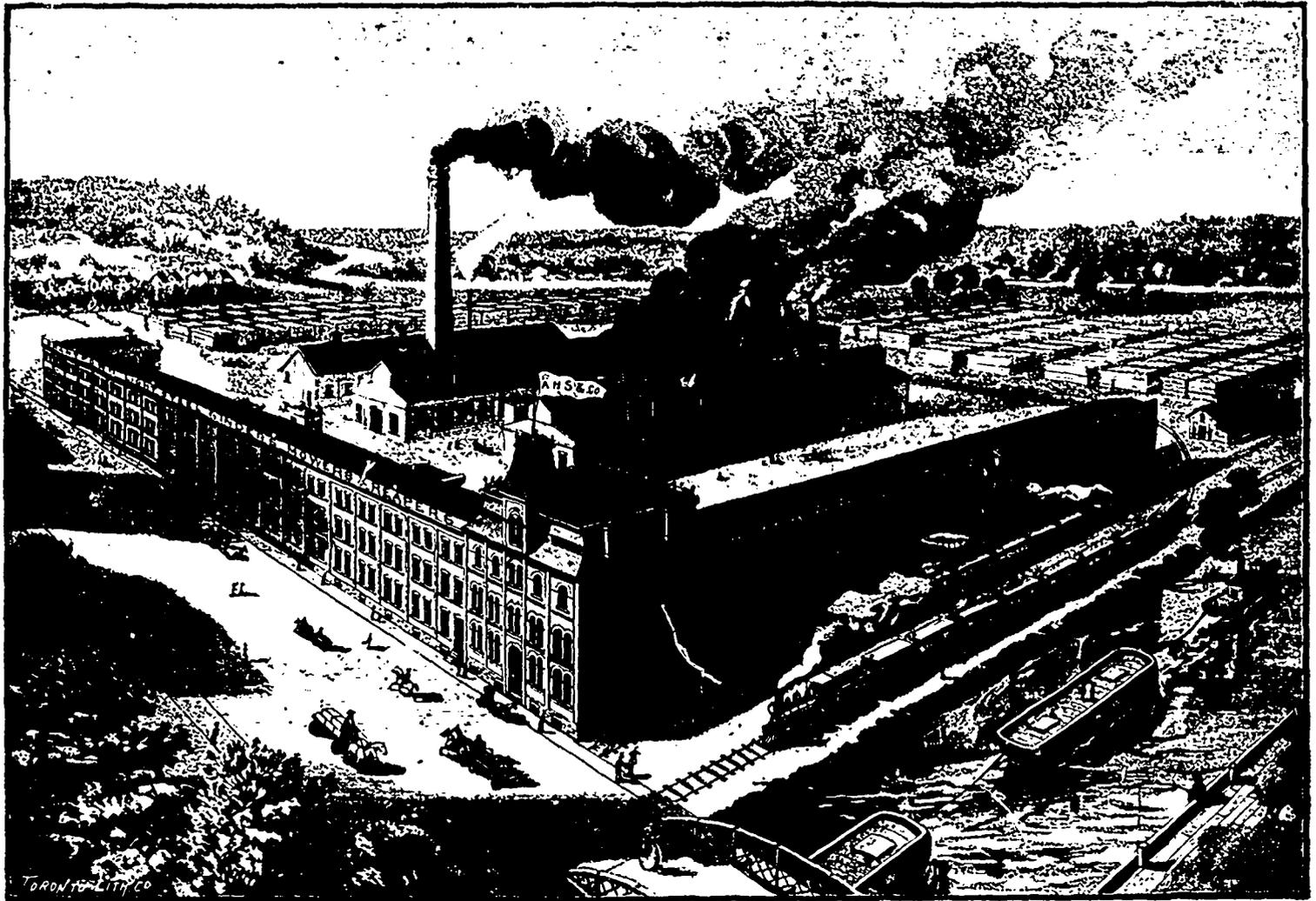
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