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THE ILLUSTRATED  
Journal of Agriculture

Montreal, October 1, 1896.

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MONTREAL EXHIBITION.

Flowers—Fruit—Vegetables—Cattle  
—Canadians, &c.—Horses—Swine  
—Outside-shows.

The indomitable enterprise of the executive of the Montreal Exposition Co., was put to a severe test by the fire which destroyed the main buildings and seemed to render the holding of the fair an impossibility this season. But they were fully equal to the occasion and in a marvellously short time erected an industrial palace, if not so large, in many respects superior to the old one.

The Exhibition was formally opened by his honor Lieutenant Governor Chabreau who warmly congratulated the managers on their ability to overcome the difficulty which surrounded them. Speeches were also made by other gentlemen, and notably by the Hon. E. J. Flynn the Premier, in the course of which he said that the policy of the Provincial Government was to develop the resources of the Country especially as regards its productions of the farm, the forest, and the mine, and he found valuable assistants in these industrial reunions.

After the speeches, the prizes awarded for Agricultural merit were distributed by His honor the Lieutenant Governor which was quite interesting and it must have been a proud moment for the gentlemen receiving them. The intrinsic value of the prize is nothing in comparison to the glory of obtaining it by perseverance and well directed effort, beside which, it will be a joy to the families and posterity of the recipients in days to come, showing that their ancestors had achieved a peaceful victory as honorable as if they had done so on the field of battle.

But to describe some of the most important pictures of the fair.

The Arts and Manufactures Department is necessarily somewhat curtailed for the want of space, but contains many articles for use in, or the tasteful decoration of the home well worth inspection, which, it seems to me, are displayed with greater neatness and attention to detail than formerly.

The Horticultural Exhibition is pronounced by many to be the best ever held in Montreal, and we may very safely therefore add, in Canada, and reflects the highest credit on all concerned. The decorations of the hall are light and elegant, although formed of the stems of one of our commonest garden-plants, asparagus, with some flowers interspersed.

The groups of beautiful exotic exhibited by MM. F. Roy, J. Beatrix and H. Mayer were never excelled and were objects to "be looked at once and dreamed of for ever." Here there were exquisite orchids from Mr. Wilshire gardener to R. B. Angus Esq.,

PERNS—the like of which it was conceded by all never were before exhibited. Crotons, Flowering Begonias, also quite unique in their class of plants, Caladiums, Anthemims etc., from Mr. Roy who again stands at the head of the class of prize winners, and has been very active in doing all he could to contribute to the success of the Exhibition. The other professional gardeners: Messrs. Beatrix, Wilshire, Bull, Trussell, Mayer, Pannetiau, Smith, etc., have shown more conclusively than ever that they are men of skill and enthusiasm.

The good that these men do, when aided liberally by their patrons and

employers, in improving the moral tone of the community is incalculable, they are, without perhaps realising the fact philanthropists of no mean order.

The cut flowers are in abundance this year and very fine. A large group arranged in a circular shape, very tastefully, obtained the first premiums for Mr. F. Roy, Mr. Trussell and Mr. Reid came second and third with their elegant collection, not much inferior, and there were three others all deserving a prize.

There was a great display of the beautiful Gladioli; Mr. Reid's collection especially.

Vases of flowers, baskets, bouquets were more numerous than on any former occasion.

It was unfortunate that, notwithstanding there had been a large extent added, there was still insufficient space and some very fine Geraniums, Cannas and Hydrangeas had to be placed outside the hall. However they were there, and did great credit to the growers. Messrs. Trussell, Roy, and Mayer.

FRUIT

Hothouse grapes were well represented, the principal prizes being secured by Mr. Wilshire with some very fine bunches. Outdoor grapes too came in for their share of attention. "Apples." The season has been good for this crop and the result is the finest display as to quantity and quality. I could not help thinking that such an Exhibit in London would astonish even the Britishers, and would popularise our fruit by its very appearance as to colours, alone, a quality lacking in English apples, and make exportation profitable, especially when we get the cold storage applied to the shipment of fruit as well as to dairy products, and adopt a system of selection, packing, and careful handling, which will place it in the markets of the old world in as good condition as we see it here to day.

VEGETABLES

In the Market Gardeners and Amateur departments are of superior quality such onions and potatoes are seldom seen, in fact all show that the season has been propitious and cultivation excellent. Two fine collections of vegetables were exhibited; one from Mr. Ceguay of St. Foye road Quebec contained many novelties which will prove great improvements on old varieties. Mr. Caguay's exhibit did credit to the young and enterprising Quebec gardener.

Mr. Hall of Outremont also contributed a great many well grown specimens of various vegetables, securing many of the first prizes.

In the Agricultural roots I was glad to notice that for Turnips, Mangolds, carrots etc., the prizes were given to wonderfully fine clean roots grown by neighbouring farmers and did not go out of the Province. Showing that more attention was being turned to the more extensive and careful culture of these most important crops.

Grain showed how extra good crops had been and was of unusual excellence, the sheaves of oats and barley which received the first awards were remarkable as to straw and corn. It is a significant fact in favour of the "Banner" oat that it took all the first prizes and proved itself the best variety in most respects.

Potatoes showed how good the season had been for them and were very fine in quality, and numerous. The end of the Hall where the roots were on show

was gazed with two very nice and interesting displays of garden and field products; one from the Longue-Pointe and the other from the Verdun Lunatic Asylum which have been grown by the inmates were very interesting to visitors. Perhaps the most important part of the show of flowers was the children's for I can conceive of no means that could have been adopted to render the exhibition more useful than making it an educational institution, by offering prizes to the children, and nobly they responded this year. No fewer than 700 entries having been made of the Antirrhinums given them to cultivate last spring and many of them showed that they had been carefully attended to. This effort of the Society to implant the love of Gardening in the youthful mind should commend it to all lovers of the human race whose condition it is every good man's desire to ameliorate.

CATTLE

The entries for cattle were not so full this season as last owing no doubt to the fact that many intending exhibitors changed their plans in consequence of the fire which they thought would preclude the possibility of holding an Exhibition this year.

As usual the Ayrshire class was the most largely represented and Mr. Dr. McLachlan of Petite Côte won first prize for his 3 years old Bull, a fine animal in all points. He also took the sweepstakes for the best Bull of any age and was placed first with his herd of one bull and four females. Mr. D. Drummond of Petite Côte also figures largely among the winners of prizes in this class. Being first for Bull calf 1 year;

4 years old cow, 1st.

Heifer 2 years old.

Heifer calf under 1 year.

Exhibition's herd 2nd

Breeders' herd.—1 Bull four heifers 1st.

Cow of any age: 1st, besides several other prizes of less value in the class.

The other prizes were pretty equally distributed between MM. James Drummond of Petite Côte, James Johnston, Como, Dawes & Co Lachine—Beaulieu, Williamstown Ont.; Robertson, Como, Wylie, Howick, P. Q., Fraser, St. Laurent, P. Q., Wyatt Bros, St. Louis de Gonzague, Peter Caner, Ormstown, P. Q., I. G. Main, Howick. As usual the Ayrshires have been the most largely represented of any other breed and the Jerseys as a Dairyman's breed seem to have lost ground on account of their diminutive size. The Guernsey which are well represented seem to be rising in favour as Dairy cows. There is no doubt but that their cream is rich and the butter made from it of superior quality, especially as to colour, while their size recommends them to the minds of many. The chief Exhibitors in this class are the Hon Sydney Fisher; Isaleigh Grange farm, W. Butler & Son Ont. Isaleigh Grange taking the first for Exhibition's herd and the Hon. Sydney Fisher for Breeder's young herd. While the sweepstakes and medal for Bull of any age was won by the Grange and the Cow ditto by Wm. Butler & Son, Dereham Centre, Oxford Co., Ont.

The Canadian Cattle were there in considerable numbers which we were glad to see, and hope that by careful selection this useful breed may be much improved.

Grade Cattle are not up to the mark, and if they are to be useful great care must be observed in the breeding, as scrubs are no use in these days of choice pure bred animals of any breed.

and especially of those which have proved their capacity to produce milk or beef profitably as the case may be.

Holsteins, which many look upon as a most useful breed were exhibited by MM. Clemows, St. George Ont.; Gilroy & Son, Buell Ont.; M. Horner Jr, Emery Ont.; we missed the pure herd of Bulls and McDuffy of Stanstead P. Q., who for some reason did not show up.

Herefords were good, and well represented by animals from H. D. Smith, Compton; D. M. Wilson, Moos River, Compton Co.; there were no other Exhibitors.

M. W. W. Ag'dime, Lachine rapids MM Stuart & Son Lucasville, Ont., B. H. Pope, Cookshire, P. Q., James Bowman Guelph, Ont., D. M. Wilson Moos River Stuart winning the medal for Bull and R. H. Hope for Cow or any age were the successful exhibitor of Polled ed Angus. Galloways were shown by MM. D. McCrea of Guelph, Ont.; and Mr. John Sibald, Annap, Ont. Some of the finest herds of Jerseys were put in the Exhibition. Mrs Jones did not send. Good cattle were shown by W. A. Reburn & Co., Ste. Anne de Bellevue; Wm. Smith & Son, Highfield Ont.; Wm. Rolph, Markham, Ont.; B. H. Pope and P. S. Witherall, Cookshire, P. Q., and W. Wicks, New Toronto, Ont., who took the medal for Bull of any age.

To sum up, we may assert that although the cattle show was not so well fixed up as last year in consequence of the untoward circumstances above alluded to, the quality in the most important breeds was fully maintained, and we see no reason for discouragement but rather than the Directors should continue with renewed vigour and determination to assist the farmer and dairy men by encouraging the breeding of such animals as will make their business prosperous. For to the feeders either for the production of beef or milk there is no doubt but that breed is the first consideration; we can never be successful with anything short of the best.

#### HORSES.

Thoroughbreds: Mr. Dawes of Lachine, Mr. Newman of the same place and Mr. F. S. Wetherall of Cookshire won all the prizes in this class.

Roadsters: In this class there were quite a number of competitors, principally, Mr. P. A. Mallette, Montreal; I. P. Dawes Lachine, I. I. Anderson, Drummondville, Ont., Nap. Lachapelle, St. Paul l'Hermite, Que., L. S. Campbell, Montreal; James Roy, Bordeaux W. Dent Dalton, Delhi Ont., Dominion Stable Co., T. D. Bryzell & Co., Montreal, who won Mr. Wiseman's gold medal, and R. H. Pope, Cookshire; Geo. Hogg, Hochelaga; S. Howard, Montreal amongst whom the prizes were pretty equally divided.

#### DRAUGHT HORSES

Successful Exhibitors, John McOlerly Allens corners; S. Nesbit, Petite Côte, M. McGerrigle, Ormstown, P. Q., Louis Lefebvre, St. Rémi, P. Q., Albert Carlier, St. Paul l'Hermite, Wall Bros., St. Louis Station, P. Q., S. Nesbit, Petite Côte, Robt Cairns, Cairnside, P. Q.

#### HEAVY DRAUGHT HORSES

1 years old, 1st Charles Turner, St. Etienne, P. Q., Joseph Ste. Marie, La Prairie, André Viau, Boucherville, Dr Craik, Petite Côte, Watts Bros., Geo. Hogg, Hochelaga.

#### PERCHERONS

Thos. Dolbec, Lachute.  
Louis Beaubien, Outremont.  
Louis Sicard, St. Leonard.

Institution for Deaf and Mutes Mile-End which took 4 prizes namely: stallion 3 years old, pair and best mare; ditto, with two of her progeny. While the gold medal, presented by the Canadian Produce Co., was won by Mr. Beaubien of Outremont for his magnificent Canadian bred horse.

#### CANADIAN HORSES

Where shown by J. E. Boucher, Ste. Madeleine; Jos. Laporte, St. Norbert; Louis Langevin, Varennes; Jos. Deland, l'Acadie et J. B. Robillard of the same place. E. A. Genereux, Montreal; Chas. Normandin, Boucherville; C. S. Campbell, Henri Deland, l'Acadie.

#### HACKNEYS.

In these the principal exhibitors were the Hillhurst Farm, P. Q., which secured all the prizes in this class except for the 4 years old Stallion won by J. E. Herbert, St. Johns, P. Q., and Ashon and Hardy, Montreal, 3 years old Stallion.

#### SWINE

There were a good many entries for swine, and the exhibit was about the usual average. Geo Green of Favreau Ont., almost swept the deck for Berkshires; MM. McNell of Ormstown, Ed. Kenny of St. Vincent de Paul; A. T. Dawes, Lachine; A. Muir, Sr., of Huntingdon; also showing some pigs of good quality.

Again, in Suffolks, Mr. Robt. Dorsey Burnhampton, Ont.; took all the prizes except one for 6 months sow, taken by Jos Featherstone, Streetsville, Ont.; H. George and Son, Compton, Ont., secured all the prizes for Tamworths, and W. H. Jones, Mount Elgin, Ont., for Poland Chinas.

In Chester Whites, there was a little more competition but the 1st prizes were pretty equally divided between W. Butler and Son of Dereham Centre, and H. George and Son of Crampton, Ont.

Large Yorkshires Victorias and Essex were sent by F. Featherstone, Streetsville Ont., J. H. Loyd, St. Lin, Quebec, Samuel Man, Terrebonne, P. Q., Butler and Son and St. George and Sons of Crampton took most of the prizes for Duroc Jerseys.

Featherstone and Isaleigh Grange Farm, Que., had the prizes for Improved Yorkshires, J. H. Lloyd, St. Lin, P. Q., and J. Turcot, Sault au Recollet, coming in for a prize each.

Where are our Provincial Breeders of hogs, that they have again let those from the sister Province carry off the bulk of the prizes?

Sheep were not quite so numerous as usual but of good quality generally. It is pleasing to remark that the short-wolled Downes were greatly in the majority. They suit our severe climate best, give sweeter and better mutton and earlier lambs, therefore should be encouraged.

The show of Poultry was about an average and some pens of very pure birds were on exhibition, but nothing to excite any special remarks.

To sum up, what are the lessons taught by this Exhibition? First, that in many respects it is an improvement in former ones, the arrangements are more complete in many respects. The new building although temporary is well adapted for the purposes to which it is applied, clearing away the showing to the upper part of the ground is a great

improvement in all ways. The ring itself is made larger and more convenient and the space formerly unoccupied makes a fine promenade for visitors, especially the little one who without danger to life and high can revel in the delight of a gambol on the beautiful fresh grass. Another improvement is that the amusements of a noisy and, to many, disagreeable character are away from the Exhibition proper over the Bridge, and if people want to see the wild beasts, quadruped, or biped, they can find them there, and are not annoyed by them while contemplating the beauties of nature and art, and listening to the sweet strains of good music instead of discordant yells natural or artificial which they would have to endure "over the Bridge".

It is a pity that it is not possible at present to run these Exhibitions as they do in England and Scotland without these outside attractions, which are not of an elevating character (except perhaps in the boats swing, but as that seems a problem yet to be solved the Directors have done well to keep them apart.

The Directors and managers have done more to make their Fair educational than ever before and the more this idea is acted upon the more should their efforts be appreciated and rewarded both by Government and the public patronage.

GEO. MOORE.

#### CROWDS AT THE EXHIBITION.

Fourteen Thousand Visitors to the Grounds Yesterday.

#### GRAND SHOW OF HORSES.

What the Farmers Enjoyed—The Prize Lists of Several Department.

(From the "Montreal Witness.")

The farmers had glorious weather for their day at the exhibition and a goodly number of them were early on the grounds and they brought their lady friends along in much larger numbers than usual. As a matter of course, the live stock came in for considerable attention at first, especially the cattle, sheep and swine, but the horses being cooped up in narrow stalls with only their posterior parts in sight, were not a drawing card for country folk, who are accustomed to see horses of all sort roaming over fat pastures in the full enjoyment of liberty. But it was in the agricultural and horticultural buildings that the country people found their greatest pleasure. The flowers and fruit were charming and the large display of them was rather bewildering. Indeed, this was the best display of fruits and flowers that most of them had ever seen, while turnips, weighing from fifteen to twenty pounds, and mangels that would take two small boys to lift, not to speak of the mammoth squashes and overgrown onion, beets, carrots and cabbages, which made up an exhibition in itself worth coming many miles to see. The dairy building was speedily gone over, the only thing there which seemed to secure more than a passing glance was a triple-acting, manpower for driving a revolving barrel churn. In this churning arrangement the weight of the operator's body, the pushing and drawing power of his hands and arms, and the pressure of his feet

are all employed in unison to keep the churn revolving. In making the rounds of the interior of the main building much more time was spent and the ladies sometimes displayed a disposition to linger longer in gazing on the many fine things to be seen on some of the stalls, than their gentlemen escorts cared to devote to such subjects. In due course of time the exhibits on the south side of Mount Royal avenue were looked over, but in some faces there were visible expressions of disappointment that this part of the show was not larger and more varied, but the time comes for holding a "world's fair" in Montreal this department will, it is to be hoped, make a much better showing.

#### HORSES.

The show of horses at the Exhibition is fully up to former years both in numbers and also in the individual merits of the various animals shown. There were not so many horses shown by persons living in and around Montreal as in former years, but the deficiency was more than made up by the horses brought from considerable distances, especially from Western Ontario.

J. P. Dawes of Lachine was as usual the largest exhibitor of thoroughbred horses, roadsters and carriage horses, fifteen head of Mr. Dawes's horses being on exhibition. James Roy of Sault aux Recollets had nine showy animals in the carriage and roadster classes, and the Dominion Stock Company of Montreal had eight more. James McVey of Montreal had five, and B. J. Coughlin had three hunters and carriage horses. There were also several other pairs belonging to city gentlemen. The Hon. M. H. Cochrane of Hillhurst had twelve very fine hackneys and carriage horses, while Mr. D. Dalton and Mr. R. M. Wilson of Delhi, Ont., had between them sixteen very fine roadsters and carriage horses. D. T. Creig of Allan's Corners had seven trotters and carriage horses, and George Moir of Howick had four more. R. H. Pope of Cookshire had three carriage horses and one Percheron stallion.

The Clydesdale horses were better represented than usual, R. Ness of Howick having nine Clydes and two French coaching horses. Messrs. D. & O. Serby of Guelph had eight very fine Clydesdale horses, and James D. Davidson of Balsam, Ont., had as many more. Both of these droves were among the best prize-takers in Toronto lately. The McGerrigle Bros. of Ormstown, Que., had four Clydes and three carriage horses, and P. Harold of Tivestock, Ont., had five superior Clydes and four carriage horses. The Deaf Mute Institute of Mile-End had five Percheron horses on exhibition, and a remarkably intelligent deaf mute was in charge of them. The Messrs. Beaubien of Outremont had four Percherons, and several others had each one horse of this breed. There were also about a dozen exhibitors of one or two horses each, of the Clydesdale breed.

The French-Canadian horses were much more numerous and also of better quality than usual. Mr. J. Deland of l'Acadie had eight pure-bred French-Canadian horses, and among the other exhibitors of one or more horses of this breed, were Alfred Gingras of St. Cesaire, Joseph Lapointe of St. Norbert, Berthier County; Eusebe Beaudin of St. Madeleine, and Louis Langevin of Varennes, who had two very fine Canadian stallions.

## THE ATTENDANCE.

The attendance at the exhibition grounds on Friday last was 206; on Saturday, 1,679 adults and between 10,000 and 12,000 children. On Monday the attendance was 8,097 adults and 791 children.

The attendance yesterday was about fourteen thousand.

## PRIZE LISTS

The judging of the cattle, which was commenced on Monday afternoon, was concluded yesterday. In all the different grades the competition was very keen, and the judges, in some instances, had some difficulty in arriving at an impartial decision. In the Ayrshire class Mr. F. S. Peer, of Mount Morris, N.-Y., was the judge, the prizes being awarded as follows:

## AYRSHIRES.

Bulls, three years old and upwards—1, D. McLachlan, Petite Côte, Que.; 2, D. Drummond, Petite Côte, Que.; 3, D. Fraser, St. Laurent, Que.; 4, James Drummond, Petite Côte, Que.; 5, Watt Brothers, St. Louis Station, Que.; 6, Dawes & Co., Lachine, Que.

Bull two years old—1, Wm. Wylie, of Howick, Que.; 2, Wm. Wylie, Howick, Que.; 3, James Drummond, Petite Côte, Que.; 4, J. Johnston, Como, Que.; 5, D. McLachlan, Petite Côte, Que.

Bull, one year old—1, John Howick, St. Louis de Gonzague, Que.; 2, R. Robertson, Compton, Que.; 3, D. Benning, Williamstown, Ont.; 4, D. McLachlan, Petite Côte, Que.

Bull calf, under one year—1, D. Drummond, Petite Côte, Que.; 2, Dawes & Co., Lachine, Que.; 3, Wm. Wylie, Howick, Que.; 4, R. Robertson, Compton, Que.; 5, James Drummond, Petite Côte, Que.; highly commended, D. McLachlan and D. Drummond, Petite Côte.

Bull calf, under six months—1, D. Benning, Williamstown, Ont.; 2, D. Benning, Williamstown, Ont.; 3, Peter Cavers, Ormstown; 4, D. Benning, Williamstown.

Cow, four years old and over—1, D. Drummond, Petite Côte, 2, Dawes & Co., Lachine; 3, R. Robertson, Compton.

Cow, three years old and over—1, Dawes & Co., Lachine, Que.; 2, J. G. Mair, of Howick, Que.; 3, R. Robertson, Compton, Que.; 4, W. Wylie, Howick, Que.; 5, James Drummond, Petite Côte; highly commended, W. Wylie, Howick.

Heifer, two years old and under three—1, D. Drummond, Petite Côte; 2, R. Robertson, Compton; 3, D. Drummond, Petite Côte; 4, James Drummond, Petite Côte; 5, James Johnston, Como.

Heifer, one year old and under two—1, J. Johnston, Como; 2, Daniel Drummond, Petite Côte; 3, R. Robertson, Compton; highly commended, James Johnston, Como; and D. McLachlan, Petite Côte.

Heifer calf, under one year and over six months—1, D. Drummond, Petite Côte; 2, James Johnston, Como, Que.; 3, W. Wylie, Howick, Que.; 4, R. Robertson, Compton, Que.; 5, D. McLachlan, Petite Côte; highly commended, James Drummond, Petite Côte; Dawes & Co., Lachine.

Heifer calf, six months and under—1, D. Benning, Williamstown, Ont.; 2, D. Benning, Williamstown, Ont.; 3, D. Benning, Williamstown, Ont.; 4, William Wylie, of Howick.

Exhibitor's Herd.—Herd to consist of one bull and four females—1, D. McLachlan, of Petite Côte; 2, D. Drum-

mond, Petite Côte; 3, Dawes & Co., Lachine. Highly commended, James Johnston, Jas. Drummond, Petite Côte; R. Robertson, Compton; W. Wylie, Howick, Que.

Breeder's Young Herd—Herd to consist of one bull under two years, two heifers, one year and under two, and two heifer calves, under one year—1, D. Drummond, Petite Côte; 2, R. Robertson, Compton, Que.; 3, James Drummond, Petite Côte.

Sweepstakes—Bull of any age—1, D. McLachlan, Petite Côte, medal.

Cow of any age—1, D. Drummond, Petite Côte, medal.

## CANADIAN CATTLE

Bull, three years old and upwards—1, Asile St. Jean de Dieu, Longue Pointe; 2, Arsène Denis, St. Norbert, Que.; 3, L. Thonie, Repentigny, Que.; 4, T. O. Bourdon, Chateauguay, Que.

Bull, two years old—1, Louis Thonie, Repentigny, Que.; 2, A. Denis, St. Norbert, Que.; 3, M. Demers, St. Eustache, Que.; 4, A. Denis, St. Norbert.

Bull, one year old—1, T. O. Bourdon, Chateauguay, Que.; 2, A. Denis, St. Norbert, Que.; 3, M. Demers, St. Eustache, Que.; 4, G. Carr, Compton, Que.

Bull calf, six months and under one year—1, M. Demers, St. Eustache, Que.; 2, A. Denis, St. Norbert, Que.; 3, M. Demers, St. Eustache, Que.; 4, J. B. Deland, L'Acadie, Que.

Cow, three years old or over—1, M. Demers, St. Eustache, Que.; 2, A. Denis, St. Norbert, Que.; 3, Louis Thonie, Repentigny, Que.; 4, Arsène Denis, St. Norbert, Que.

Heifer, two years old and under three—1, Arsène Denis, St. Norbert, Que.; 2, L. Thonie, Repentigny, Que.; 3, A. Denis, St. Norbert, Que.; 4, Rev. Pères Trappistes, La Trappe, Que.

Heifer, one year old and under two—1, J. B. Deland, L'Acadie, Que.; 2, A. Denis, St. Norbert; 3, Trappist Fathers, La Trappe, Que.; 4, G. Carr, Compton, Que.

Heifer calf, six months and under one year—1, M. Demers, St. Eustache, Que.; 2, A. Denis, St. Norbert, Que.; 3, L. Thonie, Repentigny, Que.; 4, T. O. Bourdon, Chateauguay, Que.

Heifer calf, under six months—1, M. Demers, St. Eustache, Que.; 2, J. B. Deland, L'Acadie, Que.; 3, Louis Thonie, Repentigny, Que.; 4, Arsène Denis, St. Norbert, Que.

Exhibitor's Herd—Herd to consist of one bull and four females—1, A. Denis, St. Norbert, gold medal given by L. Villeneuve & Co., for first prize; 2, M. Demers, St. Eustache.

Breeder's Young Herd—Herd to consist of one bull under two years, two heifers one year and under two, and two heifer calves, under one year—1, Arsène Denis, St. Norbert; 2, M. Demers, St. Eustache; silver medal given by V. Vallières for second prize.

Judges—S. Lesage and J. B. Guay.

## HOLSTEINS.

Bull, three years old and upwards—1, G. W. Clemons, St. George, Ont.; 2, C. T. Gilroy & Son, Glen Buell, Ont.; 3, Institution des Sourds, Mile End.

Bull, two years old—1, A. Hoover, Jr.; of Emery, Ont.

Bull, one year old—1, G. W. Clemons, St. George, Ont.

Bull calf, under one year—1, C. J. Gilroy & Son, Glen Buell, Ont.; 2, A. Hoover, Jr., Emery, Ont.; 3, C. J. Gilroy & Son, of Glen Buell, Ont.

Cow, three years old or over—1, C. J. Gilroy & Son, Glen Buell, Ont.; 2, A. Hoover, Jr., Emery, Ont.; 3, A. Hoover,

Jr., Emery, Ont.; 4, A. Hoover, Jr., Emery, Ont.

Heifer, two years old and under three—1, C. T. Gilroy & Son, Glen Buell, Ont.; 2, C. J. Gilroy & Son, Glen Buell, Ont.; 3, G. W. Clemons, St. George, Ont.

Heifer, one year old and under two—1, C. J. Gilroy & Son, Glen Buell, Ont.; 2, G. W. Clemons, St. George, Ont.; 3, G. W. Clemons, St. George, Ont.

Heifer calf, under one year—C. J. Gilroy & Son, Glen Buell, Ont.; 2, C. J. Gilroy & Son, Glen Buell, Ont.; 3, G. W. Clemons, St. George, Ont.; 4, G. W. Clemons, St. George, Ont.

Exhibitor's Herd—Herd to consist of one bull and four females—1, H. Hoover, Jr., of Emery, Ont.; 2, G. W. Clemons, St. George, Ont.; 3, C. J. Gilroy & Son, Glen Buell, Ont.

Breeder's Young Herd—Herd to consist of one bull under two years, two heifers one year and under two, and two heifer calves under one year—1, G. W. Clemons, of St. George, Ont.

Sweepstakes—Bull of any age—1, C. J. Gilroy & Son, Glen Buell, Ont., medal.

Judge—D. Macaulay, Shoreham, Vt.

## HEREFORDS

Bull, three years old and upwards—1, H. D. Smith, Compton, Que.; 2, D. M. Wilson, Moe's River.

Bull, one year old—1, H. D. Smith, of Compton, Que.

Bull calf, under one year—1, H. D. Smith, Compton, Que.; 2, D. M. Wilson, Moe's River, Que.; 3, H. D. Smith, Compton, Que.

Cow, three years old or over—1 and 2, H. D. Smith, Compton, Que.; 3, D. M. Wilson, Moe's River, Que.

Heifer, two years old and under three—1, H. D. Smith, Compton, Que.; 2, D. M. Wilson, Moe's River, Que.; 3, H. D. Smith, Compton, Que.

Heifer, one year old and under two—1, H. D. Smith, Compton, Que.; 2, H. D. Smith, Compton, Que.; 3, D. M. Wilson, Moe's River, Que.

Heifer calf, under one year—1, D. M. Wilson, Moe's River, Que.; 2, H. D. Smith, Compton, Que.; 3, H. D. Smith, Compton, Que.

Exhibitor's Herd—Herd to consist of one bull and four females—1, H. D. Smith, of Compton, Que.; 2, H. D. Smith, Compton, Que.; 3, D. M. Wilson, Moe's River, Que.

Breeder's Young Herd—Herd to consist of one bull under two years, two heifers, one year and under two, and two heifer calves under one year—1, H. D. Smith, of Compton, Que.

Sweepstakes—Bull of any age—1, H. D. Smith, Compton, Que.

Cow of any age—1, H. D. Smith, Compton, Que.

Judge—E. J. Bruce, Ketchum, N.-Y.

## JERSEYS OR ALDERNEYS

Bull, three years old and upwards—1, J. H. Smith & Son, Highfield, Ont.; 2, W. A. Reburn & Co., Ste Anne de Bellevue; 3, Wm. Rolph, Markham, Ont.

Bull, two years old—1, W. A. Reburn & Co., Ste Anne de Bellevue; 2, Wm. Rolph, Markham, Ont.; 3, F. S. Wetherall, Cookshire, Que.

Bull, one year old—1, Wm. Wicks, New Toronto, Ont.; 2, Dawes & Co., Lachine; 3, W. A. Reburn & Co., Ste Anne de Bellevue.

Bull calf, under one year—1, J. H. Smith & Son, Highfield, Ont.; 2, R. H. Pope, Cookshire, Que.; 3, F. S. Wetherall, Cookshire, Que.

Cow, three years old or over—1, J. H. Smith & Son, Highfield, Ont.; 2, Wm.

Rolph, Markham, Ont.; 3, J. H. Smith & Son, Highfield, Ont.

Heifer, two years old and under three—1, J. H. Smith & Son, Highfield, Ont.; 2, W. A. Reburn & Co., Ste Anne de Bellevue; 3, R. H. Pope, Cookshire, Que.

Heifer, one year old and under two—1, J. H. Smith & Son, Highfield, Ont.; 2, Dawes & Co., Lachine; 3, W. A. Reburn & Co., Ste Anne de Bellevue.

Heifer calf, under one year—1, W. A. Reburn & Co., Ste Anne de Bellevue; 2, W. A. Reburn & Co., Ste Anne de Bellevue; 3, Wm. Rolph, Markham, Ont.

Exhibitor's Herd—Herd to consist of one bull and four females—1, J. H. Smith & Son, Highfield, Ont.; 2, Wm. Rolph, Markham, Ont.; 3, W. A. Reburn & Co., Ste Anne de Bellevue.

Breeder's Young Herd—Herd to consist of one bull under two years, two heifers one year and under two, and two heifer calves under one year—1, W. A. Reburn & Co., Ste Anne de Bellevue; 2, J. H. Smith & Son, Highfield, Ont.; 3, R. H. Pope, Cookshire, Que.

Sweepstakes—Bull, of any age—1, Wm. Wicks, New Toronto, medal.

Cow, of any age—1, J. H. Smith & Son, Highfield, Ont.; medal.

## GUERNSEYS.

Bull, three years old and upwards—1, Isaleigh Grange Farm Danville, Que.; 2, Wm. Butler & Son, Dereham Centre, Oxford County, Ont.

Bull, two years—1, Wm. Butler & Son, Dereham Centre, Oxford County, Ont.; 2, Hon. Sydney Fisher, Alva Farm Knowlton, Que.

Bull calf, under one year—1, Hon. Sydney Fisher, Alva Farm, Knowlton, Que.; 2 and 3, Wm. Butler & Son, Dereham Centre, Oxford County, Ont.

Cow, three years old or over—1, Wm. Butler & Son, Dereham Centre, Oxford County, Ont.; 2 and 3, Isaleigh Grange Farm, Danville, Que.

Heifer, two years old and under three—1, Wm. Butler & Son, Dereham Centre, Oxford County, Ont.; 2, Isaleigh Grange Farm, Danville, Que.; 3, Hon. Sydney Fisher, Alva Farm, Knowlton, Que.

Heifer, one year old, and under two—1, Hon. Sydney Fisher, Alva Farm, Knowlton, Que.; 2, Isaleigh Grange Farm, Danville, Que.; 3, Wm. Butler & Son, Dereham Centre, Oxford County, Ont.

Heifer calf, under one year—1, Isaleigh Grange Farm, Danville, Que.; 2 and 3, Hon. Sydney Fisher, Alva Farm, Knowlton, Que.

Exhibitor's Herd—Herd to consist of one bull and four females—1, Isaleigh Grange Farm, Danville, Que.; 2, Wm. Butler & Son, Dereham Centre, Oxford County, Ont.; 3, Hon. Sydney Fisher, Alva Farm, Knowlton, Que.

Breeder's Young Herd—Herd to consist of one bull under two years, two heifers one year and under two, and two heifer calves under one year—1, Hon. Sydney Fisher, Alva Farm, Knowlton, Que.

Sweepstakes—Bull of any age—1, Isaleigh Grange Farm, Danville, Que., medal.

Cow of any age—1, Wm. Butler & Son, Dereham Centre, Oxford County, Ont., medal.

## TOBACCO

Best leaf tobacco, Connecticut variety—1, Ovide Marlon, St. Jacques L'Achigan, Que.; 2, N. Daupais, Montreal; 3, A. Ferland, Lanoraie, Que.

Best tobacco in rolls—1, A. Ferland,

Lanorale, Que.; 2, Ed. Ferland, Lanorale, Que.; 3, Ovide Mariou, St. Jacques L'Achigan, Que.

Canadian tobacco, best collection in leaf, packed in boxes or bales, not less than 100 lbs.—1, J. J. Gareau, St. Roch L'Achigan, Que.; 2, A. Desjardins, Ste. Thérèse, Que.; 3, Ed. Ferland, Lanorale, Que.

Special prizes presented by J. M. Fortier, Montreal.

Judge—M. Chartier, city.

DAIRY DEPARTMENT—PRIZE-LIST

CLASS 82, CHEESE, BUTTER, DAIRY UTENSILS

Cheese, best two factory (colored), made between the 10th and 20th August, 1896—1, W. G. Henderson, Dewittville, Que.; 2, Patrick Durmin, Landreville, Que.; 3, T. S. Taylor, Mooer's Station, Que.; 4, R. Werry, Knowlton, Que.; 5, J. T. Bellisle, La Dale du Fevre.

Cheese, best two factory (white), made between the 10th and 20th August, 1896—1, Andrew Fosse, Greenboro, Que.; 2, W. S. Purdy, South Stukoley, Que.; 3, Colin McInnes, Iroquois, Ont.; 4, P. H. McIntosh, Granby, Que.

Cheese, best Siltou, three of 1895 make and three of 1896 make—1, A. R. Curzon, Guelph, Ont.; 2, G. M. Graham, Guelph, Ont.

Best collection of three different makes of cheese made in Canada—3, Art. Crittenden, West Brome, Que.

Butter, best two tubs or firkins made at any butter factory creamery 1, 2 hos. Boyes, Henningford, Que.; 2, Arthur, McFarlane, Cowansville, Que.; 3, La Compagnie M<sup>l</sup>ct. de Beurre, South Durham; 4, H. Weston Parry, Compton, Que.

Butter, best two firkins or tubs, made at any farm dairy 1, John C. Durin, Waterloo, Que.; 2, Jos. J. LaGalme, L'Assomption, Que.; 3, Mrs. M. Burk, Bowmanville, Que.

Butter, best basket or box, print or rolls, the product of farm dairy 1, Mrs. M. Burk, Bowmanville, Ont.; 2, W. P. Emerson & Sons, Sutton Junction; 3, H. W. Martin, Warden, Que.; 4, N. O. Thompson, Richmond, Que.

Butter, best basket or box, prints or rolls, the product of creamery—1, Simeon Leet, Danville, P. Q.; 2, Lennoxville Creamery Co., P. Q.; 3, Hermitage Creamery Co., St. Johns, Que.; 4, H. Weston Parry, Compton, Que.

Best assortment for shipping purposes, of tubs firkins, boxes and small packages—1, W. Rutherford & Son, Atwater, diploma

"Witness."

The Dairy.

SPECIAL PRIZES FOR ESSAYS.

Section 2.—First prize. (1895)

BUTTER MAKING

Aerating—Stirring—Separating heat—Cooling—Froth—Ripening—Churning—Salt—Working—Packing, &c.

In writing on this subject I shall confine myself more especially to the methods practised in creameries which however apply more or less to the home dairy. The first thing to make sure of in the manufacture of really gilt-edged butter, is that the milk we receive daily is entirely pure and wholesome. This

is a difficult thing to do, but if all the patrons are compelled to use aerators, and use them properly and if the butter-maker is most particular in refusing all stale and tainted milk, that object is attainable.

Having received the milk into the vat, it needs all our care and vigilance, to protect the wholesome and favorable germs suspended in the milk from coming into contact with and being inoculated by other unfavorable germs the production of any body in a state of partial or entire decomposition. This care is essential from the moment even the cow is milked until the moment the butter is consumed.

We will now direct our attention to the proper handling of the milk as it passes through those processes, any of which if improperly conducted will affect the quality or the quantity of our dairy product.

When in the feeding or receiving vat, the milk should be stirred occasionally in order to keep the fat globules, which would naturally be forced to the surface, evenly distributed throughout the entire mass. The milk should be tempered gradually to the temperature desired for separating, as sudden heating makes the milk harder to separate and would not tend to improve the grain of the butter.

The temperature at which to separate depends entirely upon the machine in use and the season of the year. In winter it may be advisable to separate at a temperature of 80 or 85 F., but in summer, when the weather is warm, it is of great importance to keep the temperature down at every move, and therefore I should advise separating at from 70 to 75 which will be found to be the temp. of the milk as it is received at the factory. This may necessitate running the milk through somewhat slower than if heated artificially to 80 or 85, but as long as the skim milk tests no more than one tenth of 1 p. c., the end will justify the means, as the grain and flavor will be the better preserved to the butter, and, Mr. Patron, you who grumble because you have to wait so long, your skim milk won't sour half as easily. The cream should be taken about 15 p. c., or should contain 20 to 25 p. c., of butter fat, as thick cream can be churned at a lower temp. than thin.

Having separated our cream, it should immediately be cooled, to as low a temperature as 48 if possible, this will effectually stop all fermentation which may have commenced and will very much prevent that lack of flavor in very hot weather, and this is a point of great importance.

Having got the cream down to a uniformly low temperature, we proceed to set for ripening, and gradually raise the temperature to about 65 in summer or 80 in winter, and during this process the cream should be frequently stirred so that the cream which is in contact with the vat may not at any time become over-heated.

Any froth floating on top of the cream must be stirred in if possible, as there is fat in this froth and if left on top it will not ripen with the rest of the cream and will not churn so thoroughly, thus causing a loss of fat in the butter-milk, it sometimes also is the cause of mottled butter as it does not make the color so rapidly.

Where cream is churned the day after it is separated it is necessary to use a starter to hasten the ripening process. I use a fermentation starter composed of separated skim milk from a perfectly healthy newly calved cow,

this is set to ripen at a temperature of 80° until it loppers, then I skim off about two inches of the top in order to avoid using the impure germs which may have reached it through the air, and I also leave about an inch of that at the bottom to avoid using the precipitated caseous matter. That remaining, I stir up and strain through a fine sieve into the cream and mix thoroughly. If a supply of new milk cannot be obtained, a starter can be prepared by heating separated skim-milk to a temp. of 160 and keep it at that temp. sufficiently long to destroy all living organisms, and then ripen it gradually at a temperature from 65 to 70 and cool down and keep it on hand at a low temperature. Pure cultures for the making of starters can be prepared and are now also on the market. Having mixed in the starter, the cream should be stirred occasionally and then left undisturbed until ripe for churning.

Cream is ripe when it develops a pleasant but slightly acid taste, and is like oil, uniformly thick and smooth in appearance.

When ripe and at the proper temperature, the cream is STRAINED into the churn, in order to remove any curd or other foreign matter which may be held in suspension in it.

The churn should not be filled much more than half full in order to obtain best results.

The proper temperature at which to churn depends on the quality of the cream and on the surrounding atmosphere.

I always aim to churn as low as possible, say from 50 in summer, to 55 in winter, as a low temperature gives much more exhaustive churning as a rule. I want butter to come in 35 minutes.

If any colouring is used, it should be added directly the cream is all in the churn.

When the grains are about the size of wheat grains, I stop the churn, and draw off the butter-milk. Then I add as much pure water as there was butter-milk, at a slightly lower temperature than the cream when it was put into the churn, say 20 lower, and give the churn a few quick turns to wash the butter.

One method of salting is to run off the water in which the butter is washed at once, and let the grains in the churn drain for twenty minutes. Then add the salt as the granular butter lies in the churn, and give the churn a few slow revolutions in order to thoroughly mix the salt.

My practice however, is to convey the butter in granular form to the worker by means of a tin dish with a perforated bottom, taking care not to get too much on the table to work at once.

When the moisture pressed out of the butter runs off the table perfectly clear, I add salt from ½ to 1 oz. to the pound of butter, according to the requirements of the market supplied.

Care should be taken to procure the finest quality of pure salt on the market, and it should be kept in a sweet and dry place, as it very readily takes to it any obnoxious odors which may exist in the surrounding atmosphere.

The salt being added, it must be mixed thoroughly and uniformly, and the butter worked until all the moisture is expelled. If this can be done in one working without injury to the grain or without spoiling that clean waxy texture so desirable, so much the better, and it is then ready for packing. On the other hand it may be neces-

sary, after the salt is evenly distributed throughout the butter, to leave it for a few hours at a temperature from 50 to 55, until the salt is dissolved, then with a few turns of the worker all excess of moisture is expelled, and any break in the color removed.

The proper temperature at which to work butter is from 50 to 55. If worked at a higher temperature we may make it greasy, this may be done too by overworking it.

The appearance of butter when finished should be like wax, and it should be in a condition so that the grain would be the least injured. With regard to colouring, a color similar to straw is required for the British Market, but for the home supply a somewhat higher color is called for. Also in salting 2 p. c., is required in England, while 4 p. c., and over is called for at home.

Butter should be packed in whatever package the trade demands.

I have been using this summer, for export, the ½ cwt. (56 lbs) boxes, which give every satisfaction in England.

In packing, no air holes should be kept and all corners should be properly filled, as the tighter the packing and package, the better is the chance of the butter keeping.

All packages should be thoroughly scalded, and cooled afterwards, and a lining of parchment paper used to make it air tight.

The bare hands should never touch the butter. In all things connected with creamery work and butter making, let us remember: "CLEANLINESS IS NEXT TO GODLINESS." In fact, the profitable results attendant on cleanliness in the creamery, would almost award that virtue premier honors.

Beside bad smells, etc., etc., the following irrevocable mistakes in manipulation will injure the flavor of butter, holding cream too long at a high temperature, over-churning and over-working.

Now that we are looking across the sea for a market for our butter, we must study the requirements of that market. And if we try to improve our utmost and turn out butter with the best keeping qualities, a firm waxy article, colored a delicate primrose tint, salted just enough to tell it is salted, free from moisture, free from taint and impurities, we shall make better butter than the Danes are making, and establish for Canada a reputation as great and glorious as our cheese has already earned:

"FACILE PRINCEPS"

(Written by Mr. Horace Weston Parry, Buttermaker, Model Farm, Compton, Que.)

I hereby certify that this essay is written by our buttermaker Mr. Parry, maker of our exhibit of butter at the Provincial Exposition, Montreal.

Sept. 11th, 1895, Signed, ROBT ROBERTSON, Manager C. M. F.

THE OFFICIAL ANALYST ON THE CHEESE-COMPETITION.

Official laboratory of the Province of Quebec.

St. Hyacinthe College, July 27th 1896.

Remarks of the Chemist on water—Fat—Milk-contents—American cheese—Aroma—Salt—Volatile acids.

WATER: If I take, as a comparison, the numerous analyses of Cheddar cheese, made by Mr. Van Slyke, che-

list at the Experiment-station, Geneva, N.-Y., I find that our cheese contains less water than the cheese of the United-States. In these, the average of water for the month of June is 36.06 per cent, with extreme figures of 35.66 and 38.86. In our Canada cheese (number 40 being neglected), the average of water is 33.44 and the extreme figures 30.39, 36.45. It is true that the analyses of Mr. Van Slyke deal with absolutely new cheese, while those that I analysed were two or three weeks old.

**FAT:** In cheeses of the same kind, the quantity of fat is often in inverse ratio to the quantity of water. I should have anticipated finding more fat in our cheese than in the American cheese. Far from it: it is less by nearly two units. Must we thence conclude that our method of making causes a loss of fat? I am inclined to think so; for the fat-contents of our milk, in most districts, is as high as, if not higher than, the fat-contents of foreign milks. And, a still more astonishing fact is that the cheese made by Mr. Van Slyke was from milk yielded by Ho'steins!

To this point I would call the special attention of makers and inspectors.

It will probably be observed that two of the poorest cheeses obtained for their "aroma", one the maximum number of marks, the other 44.5, and that this last number was also awarded to the richest in fat of all the cheeses exhibited.

**SALT:** Mr. Decker, of the Wisconsin University, holds that salt both develops aroma (1) and gives body.

The cheese made by the Trappist Fathers at Oka contains 3.50 per cent of salt.

**CASEINE AND ALBUMEN:** My analyses show much more casein and albumen than Mr. Slyke's analyses show.

**VOLATILE ACIDS:** I determined the contents in volatile acids of some cheeses that were sent to me for that special purpose; but I do not think that the investigation of this point can be of much importance in the analysis of cheese. On the contrary, I should prefer that the special odours, perfectly "sul generis", that the volatile acids in some of our cheeses throw off in a very perceptible manner, should be analysed by the practised nose of an expert. (1) It is positively certain that some of the cheeses exhibited at the competition were in an advanced stage of putrid fermentation. I sent some of the volatile acids to Mr. Bourbeau, the Inspector-general; by means of these he will be in a position to support his remarks to some of his makers.

There may perhaps be an error read and it is possible that the figures of the analysis attached to the numbers should be attached to other numbers.

(Signed) C. P. CHOQUETTE,  
Director of the Official  
Laboratory.

### PROVINCIAL COMPETITION OF DAIRY-PRODUCTS.

The last provincial cheese-competition, under the direction of the Department of Agriculture, took place on September 11th, at Quebec.

(1) If any one doubts this let him try his pea-soup without salt, and then add a little salt to it.—Ed.

(1) "Sul generis" means: of its own peculiar kind.—Ed.

Thirty-six cheeses were inspected by MM. J. A. Vaillancourt, J. McKergow, and P. W. McLagan, dealers in Dairy-goods at Montreal, and subsequently by Mr. E. Bourbeau, Inspector-general of Syndicates. M. Pabbé Choquette, director of the official laboratory at St. Hyacinthe, took charge of the analyses. Out of the 36 competitors, there were placed in the first and second classes:

#### SILVER-MEDAL

R. P. Parenteau, Yamaska, 97½ marks.

#### BRONZE-MEDAL

Philippe Rhéault, Valmont, Champlain, 97 marks.

Gilbert Dallaire, St-Samuel, Beauce, 97 marks.

J. L. Blanchette, St. Valdre, Arthabaska, 96½ marks.

William Parent, St. Elphège, Yamaska, 96 marks.

Jules Pradeth, Malbafé, Charlevoix, 96 marks.

J. A. Lambert, St. Tite Village, Champlain, 96 marks.

#### MONEY-PRIZES.

Alfred Trudel, St. Prosper, Champlain, 95½ marks, \$10.00.

Octave Roy, St. Ephrem-de-Tring, 95 marks, \$8.00.

Télesphore Pellerin, Shawanegan, St. Maurice, 95 marks, \$8.00.

François Harvey, Ste. Agnès, Charlevoix, 95 marks, \$8.00.

Désiré Nadeau, Ste. Mélanie, Joliette, 94 marks, \$6.00.

Pierre Lapointe, Batiscan, Champlain, 93 marks, \$4.00.

Henri Côté, Ste. Anne, Chicoutimi, 93 marks, \$4.00.

Simon Touchette, Milton, Shefford, 92 marks, \$2.00.

Joseph Brillon, LaPrairie, Compton, 92 marks, \$2.00.

Joseph Bergeron, South Ham, Wolfe, 91 marks.

P. U. Cloutier, Ste. Thècle, Champlain, 91 marks.

Clotaire Léonard, Ste. Claire, Dorchester, 91 marks.

Noé Mercure, St. Pierre-les-Becquets, Nicolet, 91 marks.

Lazare Massé, St. Fortunat, Wolfe, 91 marks.

Henri Piché, Ste. Gertrude, Nicolet, 91 marks.

The average quality of the cheese was very much superior to that of the two prior competitions, and the general make up of the cheeses was much more attractive.

Nevertheless, some of the competitors, though their exhibits were perfectly made, lost their chance of winning a silver-medal through neglecting to pay proper attention to the external neatness and the cleanliness of both cheeses and boxes.

At any rate, it appears still more clearly from this last competition, that the cheese ordinarily made in the province of Quebec is of very high quality, and that the chief cause of its reputation sometimes suffering is, generally speaking, its want of uniformity, and the unpleasant appearance it presents when sent to market. We once more beg to call the attention of all those interested in the business to this fact.

G. HENRY.

Secretary of the Competition.

## The Horse.

### ORIGIN OF FARRIERS AND VETERINARIANS.

Derivation—Horse show—Position of veterinary surgeon is the old "farrier."

FARRIER is the name still given in rural districts to men practising what is now more properly called veterinary science. The old forms of the word were "ferror", "ferrer" and "ferrier," the last being yet in use in Scotland. The farrier was a "cow leech" or "horse doctor". While the use of the word was general, farrier really meant a shoer of horses. Hence, a man to whom horses were continually coming to be shod, gradually, according to his ability, had the horses coming to him for the treatment of any ailment that might befall them. Thus "Call the farrier", was a familiar order at the farmstead. Tracing the word, we find that it meant "a worker in iron," a blacksmith, from the Latin "ferrum", iron. Among the middle Romans, "ferrarium equorum," was a horse-shoer. With this meaning the word no doubt was taken over to England with the Conqueror.

It might be supposed that having traced the word to the Latin, we had traced also the origin of the horse-shoe itself. But the remarkable fact appears that as soon as we arrive at the origin of the word, the existence of the horse-shoe, in Rome, is immediately in doubt. In fact all traces of it disappear. Thus our investigation resolves itself entirely into discovering the source of the horse-shoe one of the mysteries that archaeology has endeavoured to solve.

In regard to the Romans, Pegge, who was the first to study this subject, said: "No notice is taken of shoeing horses, but they must have done so, more especially with their war horses. Fabretti owns that he saw upon a marble monument one depicted as shod; another we find shod on an Etruscan monument; Vossius testifies that there are marks of shoeing in the illumination of his manuscript of the Hippica: and Pliny also informs us, that, in long journeys, the camel becomes fatigued if not shod, concurring therein with Aristotle, that camels in long journeys were, likewise, shod, like oxen are in England, when they are intended to travel a hard road. But it may be asked, why was it that mules and asses were more commonly shod than horses? Because these animals were much more used in ancient times, more so than horses for riding in Judea, and for draught almost everywhere. The differences of countries or parts of countries, ought to be considered in respect of shoeing animals. Soft countries do not require the provision of shoes. Some do not shoe with us, and others only shoe the fore feet. These are reasons why the practice might not be universal among the ancients, but sometimes might be applied, and sometimes omitted."

The first discovery of the existence of ancient horse-shoes was made about 1650. This discovery refers to the fifth century. These shoes, were those of the horse of the Frankish king, Childeric. "Childeric, father of Clovis, founder of the French monarchy, had his horses shod in the fifth century. It was then customary to inter the horse along with its rider—a very ancient practice, universal in Europe,—and when Childeric's monument was discov-

ered a horse-shoe of iron was found among other things. The shoe was small, giving rise to the supposition it was that of a small animal.

Since then numerous remains have been unearthed over Northern Europe—not in Italy or Greece—proving the existence of the art of horseshoeing at an early date.

The whole history of Celtic farriery and its religious aspects is a most fascinating study, and proves an antiquity for the art, which cannot be determined. Possibly it traces to the early practice in High Asia of using stag's horn, a practice which survives in Iceland, where sheep's horns are also used—for putting on the hoofs, instead of iron.

It has been shown in an unmistakable manner, that farriery was practised and held in high estimation long before the reign of the Welsh king Howell the Good, "Hoel dia" by the primitive people of Britain, and that the court farrier was a sacred personage, on whose shoulders the mystic mantle of the Druid iron-workers had fallen. Indeed, the horseshoe was venerated as a sacred symbol by all nations. This is evidenced by the universal regard for it, even to the present day.

The evolution of the horseshoe is an interesting speculation. We know that one of the earlier forms of protection was a leather bag; then, later, the ground portion of this bag, was protected with an iron surface. The iron, frequently renovated, would at last wear away the leather, so that possibly the iron would become separated from the bag portion; perhaps then, an obnoxious nail, might have fixed the iron slightly to the hoof, which coincidence might have struck some one, with the result that he set to work to experiment in fixing directly to the hoof a protecting iron rim.

In tracing the history of the word farrier, in its "ups" we find it reached the highest plane, because its "honorary" functionaries were few; whilst, in its "downs" its actual functionaries, becoming so numerous, humbling depreciation followed; but it can safely be said that the title of farrier, has always been an honourable and distinguished one.

Farriery was also a gentleman's accomplishment. Shakespeare makes sweet Portia, speaking of one of her princely suitors, say of him: "Ay, that's a colt indeed, for he doth nothing but talk of his colt, and makes it a great appropriation to his own good parts that he can shoe, himself."

We can trace similarly the history of the word veterinary. It comes directly from the Latin "veterinarius," belonging to beast of burden: this was derived from "veteranus," aged beasts of burden: that from "veterinus," a yearling: probably the same as "vetulus" a calf. "Vet", is used, colloquially, to designate a veteran or a veterinarian.

This is the derivation of the word as given in the Century Dictionary.

The veterinary art is very ancient. One thousand years before the present era, Erichthensor, a Greek, was spoken of by various classic writers, as having broken young horses, and as having some reputation for treating them for various diseases. Chiron—"the wise Centaur" had also a considerable reputation for the treatment of sick horses. Hippocrates wrote "some three hundred years after the birth of Christ, one Vegetius wrote a book, condensing all that had been written on this subject, before him. This was the last spark that illumined the veterinary horizon for a long period, and it was followed by a profound darkness, which

continued for many centuries." During the succeeding dark ages, the curative treatment of the horse fell into the hands of the smith who shod him. The ancient and honourable name and profession of veterinarian, sanctioned by the classics of the Augustan age, became lost. His name and profession was usurped by the farrier, who, from humble beginning, rose to a position far above the wildest dreams of the most ambitious veterinarian of any age, and thence has fallen to an humbled position, where the now appreciated veterinarian will henceforth keep him.

For at last the more ancient veterinarian has regained the proud position, held in the Augustan age, by the grace of the great Hippocrates literally "horse force", though it has taken fifteen centuries to do so. To-day, therefore, veterinary infers a collegiate knowledge of the sciences necessary to a perfect mastery of the principles and practice of the curative, medical, and surgical treatment of the horse.

The farrier has certainly had a more continuous existence and recognition than the veterinarian. During almost fifteen centuries the latter was absolutely ignored, forgotten. But since the "revival," it is the farrier that has suffered. This is best indicated by the recognition by governments, not of the farrier, but of the veterinarian.

W. R. GILBERT.

## LIFE OF A LONDON 'BUS HORSE.

### American horses—Prices—Days' work Pavement.

It is well known that a good number of the horses shipped from this country to Great Britain are purchased as 'bus horses, for which purpose they are found very satisfactory. In an interview with Mr. Tilling, a large jobmaster of London, England, a correspondent of a London paper obtained from that gentleman the following information as to the life of a bus horse, in which, it will be seen, he speaks very highly of Canadian horses.

"It might be thought," said Mr. Tilling, that 'bus horses would be bred especially for the purpose, but such is not the case. I get my horses from various sources. Some of the best come from Canada. Omnibuses have increased in numbers to such an enormous extent during the last few years that the supply of omnibus horses from England is nothing like equal to the demand; in fact, an English-bred bus horse is becoming rather a rarity. The horses that run in 'buses are usually light cart horses, and perhaps one of the reasons of their being so scarce is that they are exceedingly useful horses from the farmer's point of view. They are the kind of horse that a farmer would use in his trap to drive to market on Saturdays. Such a horse is very handy, as he can be used for almost any work. He must, of course, be considerably lighter than a cart horse, or he would never do the pace required of him in a 'bus.

"From £35 to £40 is what we usually give for a 'bus horse, and, of course, we buy many at a time. They come up to town when they are about five years of age. Occasionally we have one at four, but a horse of that age is seldom up to the hard work of dragging a 'bus.

"They go through what we call the 'hardening' process first. This takes about four months. A horse accustomed all its life to soft food must be wean-

ed, as it were, on to a stronger diet. It may interest you to know that we give our 'bus horses 25 lb. of food each day. This is divided into 13 lb. of grain, consisting of oats and maize, and 10 lb. of chopped hay. We occasionally give a little bran. Unfortunately, we find that, although we accustom the horses to this hard food very gradually, we occasionally lose one, owing to the change of diet.

"We usually start them with an occasional half-journey; then we give them the whole journey; then the whole journey once a week, and so on, until they are capable of doing all the work we require from a 'bus horse, which is about eleven miles a day. As a matter of fact they do a little more than the eleven miles; but it averages out to that, as they have a rest one day in seven. Taking it all round, our 'bus horses are in the stables for twenty hours out of every twenty-four. You wouldn't think that was very hard work, would you? Yet a horse is seldom much good after he has worked for five years in a 'bus. That is the time we reckon upon, but sometimes a horse is physically incapable of doing the work, and knocks under after six months of it. The worst of it is we aren't able to discover a horse's weakness until we have started working him.

"The reason why a 'bus horse does not last longer than five years is, to put it in one word, asphalt. I should like to see every inch of that stuff taken up. It is absolutely the worst kind of road for horses that could possibly be invented. Its one merit is that it can be easily kept clean, and so down it goes.

"The wood pavement is 50 per cent. better for the horses, but it's a long way from being the most comfortable kind of road for them. If you want to see how a 'bus horse likes the asphalt and the wood pavement, watch them as they get from one on to the other. On macadam they go along in their natural stride; coming on to the wood, they pick themselves up just a little shorter; but in trotting on the asphalt they just pitter-patter along. The horses become nervous; they know the danger of one little slip; and so they trot in such way that, if one leg makes a mistake, they have another ready at once, so that they can pull themselves up. But, apart from the danger of the asphalt, there is the actual harm it does the horses' legs. (1) It's such a hard, unyielding road that I really wonder the horses' legs stand it as they do. Of course, a 'bus horse is a little better off than a cab horse, as the pole helps him tremendously.

"The constant startings and stoppings affect the horses to a considerable extent, but things are not nearly so bad now as when there were no brakes on the 'buses. It makes all the difference to a horse at the end of a journey what kind of a driver he has. There are too many "drivers" and too few "coachmen." Anyone can hold the reins and thrash the horses along till they are tired out. I call that kind of man a "driver". A number of little things may account for a horse not doing his best. A trace may be too long or too short, or his bit may not be quite comfortable. A "coachman" sees to all these little things himself.

"When horses are too old to run in 'buses they are sold, some of them going into tradesmen's carts, or into the heavy carting business. When they get unfit for town work, they go back to the country and are used for plowing

(1) Horribly true!—Ed.

and farm-work. If we have a horse that has worked well for us we turn him out on a farm which we have in connection with our stables, and do not sell him for other people to work to death. Some 'bus horses, when very lame, but otherwise healthy, are sold to go to Holland, where they are used for human food."

## HORSES.

### Imports in Eng.—Cost of transit—Age—Uniformity—Vanners—Heavy-draught horses—Glanders.

The following figures give some idea of the growth of the horse importation from Canada:

	1893	1894	1895
Stallions.....	12	40	12
Mares.....	354	1,095	3,927
Geldings.....	1,449	4,289	8,969

	1893	1894	1895
Stallions.....	£ 480	1,490	500
Mares.....	13,086	37,429	107,657
Geldings.....	58,488	142,160	261,100

Mr. Hunting, J. R. V. S., one of the most eminent authorities on this subject, is quoted in the report as follows:

"The horses imported from Canada continue to give great satisfaction to purchasers. They possess good limbs and sound constitutions, and stand the test of hard work.

"The most useful and saleable class is the "light vanner," suitable for work in omnibuses and mineral water vans—a horse about sixteen hands high and weighing from eleven to twelve hundred pounds. This animal must have courage and activity, with as much quality as possible, and be clean of limb. It should be at least five years old, and not over seven.

"Considering the cost of transit, no profit can be expected on four-year-old horses. Experienced buyers know that animals of this age cannot stand work, and therefore the demand, except at ridiculous prices, is limited to men who have yet to gain their experience. When their experience is gained by purchasing the four-year-old from a Canadian lot, they ever afterwards blame the whole class for the defects shown by an unsuitable individual. Every unsuitable horse imported helps to damage the whole class.

"Persons acquainted with the English market and the value of horses here, may be able to buy in Canada cheap horses and sell in England at a profit. Other persons venturing to send horses, should avoid the lower-priced horse and consign only what are readily saleable. The nearer all the animals of any consignment are to a uniform type the better. Buyers of that type then attend a sale in numbers, and competition follows. When a consignment of "all sorts" arrives, no great attraction is opened to any special class of buyer, and competition is slight. Whether a consignment consist of "vanners," "cabbars," or heavy-draught horses, it should be limited to the one class, so as to offer the greatest attraction to buyers.

"During the past year many good horses have come from Canada in addition to the "light vanner." A smaller horse, suitable for cab-work, has given great satisfaction after trial, and will find a good market here again in the spring. March and April are the best months for their arrival in London, but few are wanted after the end of May. The horse should not be more than 15.2

in height, short-legged, with courage and a sharp, active style of moving.

"I have always thought that the heavy waggon horse, suitable for town drays, and coal waggons could not be supplied from Canada to compete with our Shire and Clydesdale horses. This opinion I am inclined to modify in view of some of the big horses sold in London during the last year. If a profit can be obtained on Canadian horses which sell here by auction at from £40 to £50, there is a market. This price is, however, not obtainable for the narrow, long-legged animals, which have predominated amongst the heavier class imported. Such horses have been sold for £30 or less, and even then are not easily sold. This draught horse should stand 17 hands high, have good feet, and short legs. The nearer he approaches 18 cwt. in weight, the greater the chance of his being profitable to the importer.

"Now that Canadian horses have established a good reputation for themselves in Britain, every horse imported across the Atlantic is called "Canadian." It is very important that this reputation should not be injured by any unwarranted accusation against the health and stamina of the animal. Twice during the past year glanders have been discovered in imported and so-called "Canadian" horses. In both instances inquiry has resulted in tracing the disease to horses bought at Chicago. This is a subject for the consideration of the authorities, and suggests the advisability of careful inspection at the port of embarkation.

"In England we are rapidly stamping out glanders from among our horses, and when a clean bill of health has been attained, our authorities are certain to take active measures to prevent reinfection from abroad. It is satisfactory to be able to report that one large company who renew their stock almost entirely from Canadian horses, have for two years past tested all the new purchases with mallein, and so far not detected a single infected animal.

"This is strong evidence in favor of the health of horses from Canada, but it is known that horses from the United States now come here as "Canadian" and not a few of the states are infected with glanders. Some of the larger towns in the States are credited with a great deal of disease, and Chicago has been specially named in American veterinary literature as being badly infected.

"Nothing would be more adverse to the trade in horses from Canada than the discovery of glanders in newly imported horses. I therefore think some watchfulness should be exercised over horses coming into Canada from Chicago or New-York."

The whole 76 pages of the report, of which the above is a very slight resume, are teeming with interest to Canadians, both merchants and agriculturists.

## THE HACKNEY—BEDON SQUIRE.

We reëngrave from the "Country-Gentleman" the accompanying portrait of Bedon Squire 4306 winner of the sweepstakes cup as best stallion at the London Hackney Show of the present year. He is a son of Rufus 1343, dam 494 Follie by Triffitt's Fireaway 240; and was shown by Sir Walter

Gilbey. Commenting on the award, the Live-Stock Journal said.

Sir Walter Gilbey's horse has improved of late almost out of recognition, his head having fined down to the "beau ideal" of what a Hackney's napper should be like. His back and quarters are simply perfect, and his legs, supported on the best of feet, are like bars of steel. This stallion is also a superb mover, and at the walk there was probably no horse in the show that could surpass him. His victory, therefore, was particularly well received.

**Notes by the Way.**

**NITROGEN FOR MANGELS.**—We have often recommended the application of full dressing of nitrogen for the mangel, even when moderately large doses of farmyard dung have been used. As a general rule, it does not pay to give much nitrogen to any other root, though wherein the swede or the turnip differs in its needs from mangels neither chemist nor farmer can say. And, now, let Mr. Bernard Dyer, agricultural chemist of Great Tower Street, London, speak:

**MANURIAL EXPERIMENTS ON ROOTS.**

**Turnips—Mineral manures—Dung and artificials—Mangels and nitrate of soda.**

In the interesting summary of Dr. Somerville's manurial experiments in the North of England by Mr. Solomon, now in course of appearance in the "Agricultural Gazette," an account is given of the effect of various methods of manuring on turnips. The turnips are, however, more than once referred to as "roots", without any other qualification, and in the article appearing in your issue of June 22nd the results of experiments on "roots" are given without any indication that the roots were "turnips" (except in one sentence, where swedes are referred to as having been grown in 1894). The consequence is that several general conclusions are drawn which read as though they applied to roots generally, whereas they, of course, only apply to the peculiar root crop experimented with viz, turnips of one sort or another.

The figures indicate that in Dr. Somerville's experiments on turnips the application of mineral manures, when no dung is used, has given very valuable results, and that the use of a small quantity of nitrate of soda—½ cwt. per acre—in addition has been more profitable than larger dressings; while when as much as sixteen loads of dung per acre were used, the use of nitrate of soda for turnips has not been remunerative. These results are confirmatory of the general experience, that where a liberal dressing of dung is applied nitrogenous manures for turnips are unnecessary, and that on land in fairly good agricultural condition, even without dung, a moderate quantity of nitrate of soda or other readily available nitrogenous manure is often sufficient for the turnip crop.

What I am now asking the permission of the Editor to point out is that a different state of things prevails when we consider the mangel crop. The mangel appears, on soil in good condition, or when dung is freely used, to be sometimes independent of artificial phosphates; but it is so hungry for readily available nitrogen that, even when dung is used with fair liberality—say 10 or 12 tons per acre—it will generally pay to use nitrate of soda in addition, up to the rate of 3 cwt. per acre, while in some seasons it pays under these circumstances to use even 4 cwt. per acre. When such a dressing of nitrate of soda is used without a good dressing of dung, however, phosphatic manures should be used as well.

While, therefore, nitrate of soda is a manure that should, as a rule, be used cautiously and with judgment for the turnip crop, it may and should be applied with a free hand to the mangel crop, which appears never to do so well as after a liberal expenditure in soluble nitrogenous manures. In a moist climate 1 cwt. per acre should be sown with the seed; in a dry climate—as in the East of England—2 cwt. per acre may be thus sown. A second or third cwt.—as the case may be—should be top-dressed at the time of singling out, and one or two more cwt. top-dressed a little later, or withheld, at discretion, according to season and the condition of the crop.

In the often-quoted experiments carried out during several seasons by Mr. Resling and myself for the Essex Agricultural Society, even 4 cwt. of nitrate of soda per acre, in addition to 4 cwt. of phosphatic Peruvian guano, were profitably applied to mangels, to which a dressing of 12 tons of dung per acre had also been given.

BERNARD DYER, D. Sc.  
17, Great Tower Street, London, E. C.

**THE ALBUMINOID RATIO.**—The albuminoid ratio, the working out of which is still unapprehended by many people, is simply this: the proportion of the albuminous (protein) materials to the fat (or oil) and the carbohydrates (starch, sugar, gum, etc). The total number of units or percentages of fat or oil is taken, multiplied by 2.3 to bring it to the same value as the carbohydrates, and the result is divided by the units of albuminoids. The figure thus obtained is called the albuminoid ratio. Thus, in the case of wheat straw, containing, of digestible foods (nutrients) 0.8 p. cent. of albuminoids, 35.6 p. cent. of carbohydrates, and 0.4 p. cent. of fat, we find that,

$$0.4 \times 2.3 = .92$$

$$\text{and } .92 \times 35.6 = 45.6$$

$$8$$

wherefore the albuminoid ratio: the fat and carbohydrates: : 1:45.6.

This ratio is supposed, in feeding stock of all kinds, to be best suited to their needs when it is in the neighbourhood of 1.5, less for growing and more for fattening stock, but about the same for milking animals. But there are a great many reasons why an analysis of a food or a ratio may be very misleading, and on that account it must be used with caution or the use modified by circumstances, v. p. 72.

**DAIRY-SHORTHORNS.**—A fortunate man is Mr. Merry, whose four cows—real dairy-shorthorns—won six prizes at the great show of dairy-cows, held last month at Tring, England. An engraving of the four will be seen at page—of this number of the Journal, their performances were as follows.

A pretty fair yield of milk from all four, varying from 61 lbs. to 67 lbs. a day. And the butter daily produced was, in round number, 2 lbs., 2 lbs. ¾ oz., 2 lbs. 9 ¾ oz., and 2 lbs. 14 ¾ oz.

**LUCERNE.**—If any one of our readers has seen the crop of Lucerne growing on Mr. C. F. Bouthillier's farm, at Ste. Thérèse, he will understand our satisfaction at the sight of this flourishing piece of fodder when we visited "Bleury" on the 7th September. There are two acres of it and it was being cut for "the fourth time!" The land on which it was doing so well is about as poor a piece of sand as one would wish to see, but there is no subadjacent water present till a depth of 14 feet is reached, so the roots have a good scope to work in, and they avail themselves of the freedom: we dug out one plant as far as it went, and found the tap-root to be exactly "four feet long!" No wonder that all through the drought of last spring the crop grew and flourished, for it got its moisture from the subsoil and laughed at the absence of rain.

The piece was seeded down in the summer of '93, and there is not a weed to be seen in the lot, though underneath the plants there is probably some couch-grass. Two acres more will be laid down next spring, after potatoes, as Mr. Bouthillier thinks this is the most valuable crop he ever grew and will never be without it again.

"One wonders why" lucerne "has never made its way as a forage crop in the north of England. It makes hay of very high quality, or it may be grazed; but it is best adapted for sowing, and horses, cows, sheep and pigs alike thrive upon it. By beginning early and cutting about one-fourth of the field every day, so as to go over it every six weeks, a lucern field will afford a constant cut from May to October, since by the end of each six weeks the portion first mown will be ready with another crop. Until recently it was thought that lucern should be drilled in rows and kept clean by hoeing, but this is now generally admitted to be a mistake, as hoeing is apt to prove injurious to the roots. Mr. Corbett (a good authority) considers it better to sow the seed broadcast, and trust to the frequent mowings of the crop to keep down weeds, but in his own experience he has found it a still better plan to sow with the lucern a mixture of strong and quick-growing grasses, which, by rapidly covering the surface, help to exclude weeds, and have the further advantage that, if manured, they form an excellent permanent pasture by the time that the lucern, having become partially worn out, would otherwise have needed plowing up. He further says that he has grown lucern for about fifteen years, and that the land first sown has become a valuable meadow, and still shows a considerable portion of lucern."

T. BOWICK in Count. Gent.

**BARLEY.**—Such a crop of barley, too, on this farm. Two arpents yielded 112 bushels, equal to 60 bushels the imperial acre, a crop hardly ever grown even in the best farmed districts of East-England. Some of the upper part of the Bleury farm is a very useful clay-loam that, fairly treated, would grow very large crops of all kinds. Were it ours we should be tempted to try a piece of fall-wheat on it, ploughed in about 4 inches deep.

**FRUIT-PIRATES.**—The hay-drop here this year was not very good at any rate, and what there was of it was trampled all to pieces by the village people strawberry-picking. What a shame it is that such injury should be done to the property of men who are trying to set a good example to their neighbours!

**NITRAGIN.**

What it is—"Colonies"—Cost per acre—How to use it.

Certain experiments have lately been made, at Woburn, by the well known chemist, Dr Voelcker, on the newly discovered agent "nitragin." It was only six or eight months ago that the success of Dr Nobbe, of Tharand, Saxony, succeeded in the preparation of this manurial matter, on so to speak, a commercial scale. The discovery is due to HELLRIEGEL, the German analyst, and its name is intended to indicate something that makes the free nitrogen of the air fit for the food of plants. Our readers will remember that it was Hellriegel who discovered that the organisms in the nodules on the roots of leguminous plants were the agents by which the atmospheric nitrogen is converted into a form assimilable by plants. Dr. Nobbe's merit consists in the application of the discovery to practical farming by the cultivation of these organisms and the sale of what he calls "colonies" of them in bottles!

These organisms are, it seems mighty particular in their tastes. The bacteria from pea nodules act well on the pea crop, do not answer so well on the vetches, and have no influence at all on clover, though all three of these plants are leguminous plants. Conversely, the clover bacteria will have nothing to do with the pea crop.

When first these application were tried, soil was taken from a field known to be rich in the organisms required for a particular crop, and spread over a field on which that crop was to be sown. But, though this plan succeeded well enough, Dr. Nobbe found it to be not only costly and inconvenient, but he found out the possibility of transferring, along with the beneficial organisms, others that might be injurious. So, he went to work and obtained by "pure cultivation" a preparation in which all organisms except the desired ones are absent. The types are now produced on an extensive scale in Germany, and can be bought of the firm of Meister, Lucius, and Bruning, Höchst-on-the-Main, at the rate of about 60 cents a

Age. Calved Milk. Butter.

79	Victoria	Shorthorn	W. Merry	1332	6 0 0	July 10	26	57	1 15 1/2	34.06	Fair.	Good	Good	2nd prize, £15.
80	Beauty	Shorthorn	W. Merry	1130	7 0 0	July 7	29	64	1 2 9 1/2	24.55	Fair.	Good	Good	2nd Tenant-farmers' Prize, £2.
81	Daisy	Shorthorn	W. Merry	1395	5 0 0	July 17	17	61	6 2 0 1/2	29.22	Good.	Very good	Good	4th prize, £5.
82	Isabel	Cross-bred	W. Merry	1255	5 0 0	July 20	16	67	1 1 2 1/4	23.14	Fair.	Good	Good	1st prize, £20.



bottle, enough to inoculate half an acre of land.

This "nitragin" preparation may be used in two ways; either by diluting it with a little water and dressing the seed with the mixture, or by using more water, moistening about 56 lbs of soil with the liquid, letting the soil-mixture dry in the air, sowing it regularly over the land, and burying it to the depth of about three inches by cultivation. The whole thing is so wonderful, so almost incredibly valuable, if the experiments now going on in England and Germany prove its efficacy, that one feels bound to wait patiently before giving an opinion about it, until the trials are concluded, which cannot be until two or perhaps three years have expired; for, as Voelcker points out, it is only by trials that we can ascertain the extent to which land can be thus fertilised for leguminous crops, and therefore for succeeding crops. It opens up to the imagination a boundless field of possibilities, but, alas, when one has passed a long life in the cultivation of the soil, one has seen so many fair hopes dashed to the ground that the feeling is strong that practical results are often merciless in dissipating imaginative hopes.

If, for 5s. an acre, we can tap the unlimited resources of the atmosphere in nitrogen, instead of purchasing the most costly of fertilisers, there will be a great gain to begin with. But the possibilities of the new agency are not exhausted by the result upon a single crop. They extend at least to the crop following the leguminous one, and, if the first be fed on, to other following crops. But there are various questions which only experience can settle, such as whether the organisms, once applied will gradually die out, and need to be replaced, or will keep on increasing under certain conditions of cropping, and whether the application of "nitragin" will prevent "clover-sickness." The introduction of Dr. Nobbe's preparation has opened up a wide field of experimentation, and we can only hope that it will prove prolific of results substantially beneficial to agriculture.

**SILAGE.**—The question of the relative values of silage and other foods for milk-cows does not appear to be yet settled in the States; at least, so the experiments lately carried on at the New-York Experiment Station would seem to show. The following, from "Hoard's Dairyman," gives a good idea of the average of the results of the experiments:

When corn silage replaced some other food, or the amount of silage in the ration was increased, there followed: (1) In seven instances a decrease in the cost of milk, once an increase, and in one instance, little change in cost. (2) An increase in the yield of milk in six instances, and in three instances a decrease. (3) A decrease in the cost of fat in six instances, an increase twice, and little change once. (4) An increase in the amount of fat in five instances, a decrease in one, and little change in three instances. (5) An increase in the percentage of fat in the milk in six instances, a decrease in two instances, and little change once.

It will be observed that in case '5' there is an increase in the percentage of fat in the milk; so food does alter the fat contents of milk!

#### SOFT-CHEESE

The Doctor Jenner, whose recipe for making a soft cheese follows, is, or rather was, the great inventor of vac-

cinamon. As he was born and passed his life at Berkeley, the very centre of the Glos'ter cheese district, he must have been thoroughly acquainted with all the processes of the manufacture of that article.

Dr. Jenner's old rhyming recipe for making a soft cheese is worth recording, though it is fairly well known. It is as follows:—

"Would you make a soft cheese? Then I'll tell you how:

Take a gallon of milk, quite fresh from the cow;

Ere the rennet is added, the dairy-man's daughter

Must throw in a quart of the clearest spring water;

When perfectly curdled, so white and so nice,

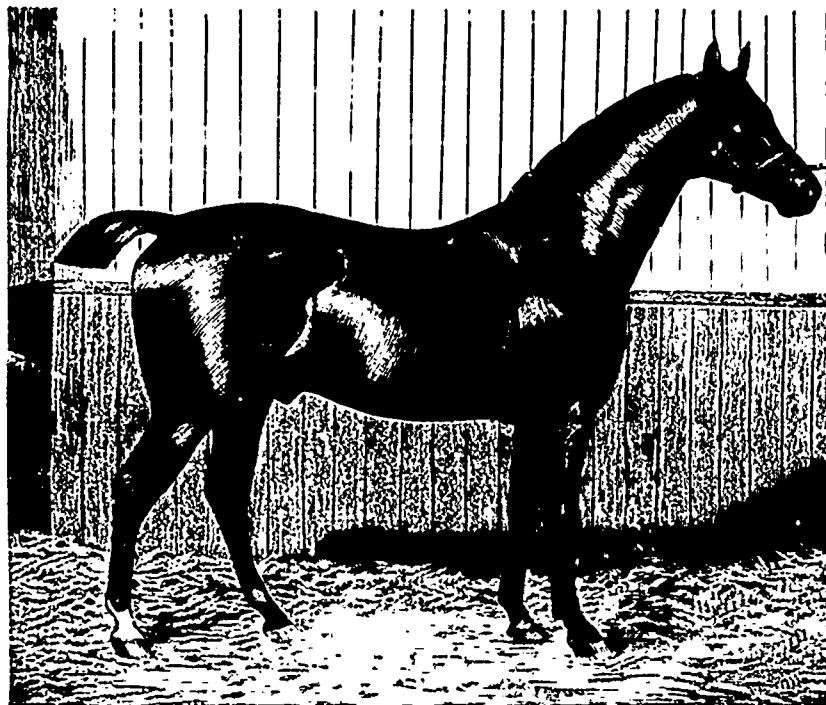
You must take it all out of the dish with a slice,

And put it, 'thout breaking, with care in the vat,

With a cheese cloth at bottom; be sure to mind that.

This delicate matter take care not to squeeze,

But all as the whey passes off by degrees.



THE SWEETSTAKES STALLION AT THE LONDON HACKNEY SHOW OF 1896.

Next day you may turn it, and do not be loth

To wipe it quite dry with a fine linen cloth.

That this must be done you cannot well doubt,

As long as you see any whey oozing out.

The cheese is now finished, and nice it will be

If enveloped in leaves from the green ash tree,

Or, what will do better, at least full as well,

In nettles just pluck'd from the bank of the dell."

Something like Camembert, is it not?

**GLOSTER-CHEESE.**—This cheese, made in the Vale of Berkeley (the Valley of the Severn), is now (Sept. 2nd) rather scarce on account of the shortness of grass. Prime dairies are in demand, and sell freely at from 4s. to 5s. per cwt. (112 lbs.), an advance of 3s. a cwt. on the August market. This advance is equal to nearly 2 cents a lb. in our currency.

**LATE-CROPS.**—We were glad to find, in our little "tournee" (Sept. 7th) the other day, that, at all events in the

Ste Thérèse district, the practice of sowing grain up to the middle of June seems to be abandoned. We only saw two pieces of late oats and one of pease. Of course there were several patches of late buckwheat, as there usually are, but that does not signify much, the quantity grown is so trifling.

**PRIZE ESSAYS.**—We have received the essays written in the competition for prizes offered by the Exhibition Company of Montreal. Very few competitors we regret to say; only nine essays having been sent in and, judging from the style, at least four out of the nine are from the same hand (1). As, in accordance with our advice of last year, no names are attached, we have the advantage of adjudicating with perfect freedom from personal bias.

At the Exhibitions, in Yorkshire pigs of both large and small kinds and Essex pigs. Mr. Featherston, of Streetsville, Ont., was quite up to his old form.

#### FARM-WORK FOR OCTOBER.

Deep ploughing — Water-furrows —  
Width of ridges — Harvesting roots —  
Stock — Dressing grain.

Round come the seasons, one after the other, and the same tasks await the farmer this fall as were laid upon him in the autumns preceding. The crops are all in; realisation of their products has begun, and now the principal work to be done is the work needed to prepare the land for next spring.

We cannot lay too much stress on the beneficial effects of the deep ploughing in the fall of all the fields intended for manured crops in the following spring. Deep ploughing for grain-crops we do not approve of, especially on heavy land; but the turning up of a couple of inches or so of the subsoil to the mechanical influence of the frost when that moderate proportion of raw earth is to be well mixed with the upper

(1) To which four, we regret to say we were obliged to award all four prizes. Really, the writer, Mr. James Dickson, of Trenholmeville, must not be so greedy another year!—Ed.

soil by the subsequent action of grubber, harrow, and roller, together with the ameliorating effect of a heavy dressing of farmyard dung, cannot but assist the roots of the following hood-crops in their arduous task of foraging here and there in search of that humidity, so scarce in our hot summers, and without which the food which nature or the farmer so plentifully supplies to the land cannot be assimilated by the plants whose mouths these roots are.

Wherefore, after you have prepared your land by "stubble-cleaning," plough deep for the ensuing crops, laying the furrows nearly-up at an angle of forty-five degrees; that is, if you plough seven inches deep, your furrow should be ten inches wide; and not being led away by non-practical men to make your ridges, on heavy land, too wide. With all the convenience we can see in wide ridges for the operations of harvesting grain-crops, it must be remembered that, on our undrained clays, a quick and ready exit for any heavy fall of rain, or sudden thaw, is a most desirable thing, and that this cannot be secured except by moderately narrow ridges and plenty of water-furrows.

Narrowish ridges, deep-ploughing, with a four-horse plough, in the fall, and wisely located water-furrows were the boast of the County of Kent, where we began our farm-education, and very large indeed were the crops produced by this system. Not that the soil itself was anything to glory in. It was, at least on our paternal estate, a poor clay, with here and there an acre or two of sand of the poorest kind, and the rent of the surrounding district, not 12 miles from London Bridge, was only a pound (£1.56 1-3) an acre: so it could not be very good land! However, deep cultivation, moderate manuring, judgment exercised in keeping the horses and implements off the land when wet, making the ridges to fit the drill and harrows, so that the teams, in drilling, harrowing, etc., always walked in the furrows; all these minutiae were so carefully practised that this very moderately fertile land not infrequently yielded from 40 to 48 bushels of wheat to the imperial acre.

We said so much about the root-harvest, a month or so ago, that it would be a waste of time and space to go over the same ground again. All that need be said here is that, in storing the root-crop, care should be taken to give potatoes and mangels that part of the root-house or cellar that is the most secure from the frost; the table-carrots should, if possible, be covered up in sand or finely sifted earth, to keep them from shrivelling, while the swedes can take pretty good care of themselves.

We were surprised to see, in August, with the thermometer at 90s several lots of parsnips in the Montreal Market. Every one ought to know that a parsnip is not fit to eat until there has been a good sharp frost. In England, they are rarely seen on the table until the month of February.

**STOCK** are still at liberty in the fields, except the work-horses, and the brood-sows that have littered. The colts and fillies may stay out if the weather be fine and not too cold, but the plough-teams should indisputably be kept in the stables and be well fed. Ten hours work a day before the plough is deserving of reward, so do not stint your oats, of which there is, we are glad to see, an abundant crop. If you have a few bushels of pease to spare, do not grudge your horses two or three pecks

a week. Beans (horse-beans) of course would be better, but, unfortunately very few are grown here.

The COWS will not do much better for being allowed to lie out all night in a bare-eaten pasture. A mixed ration of dry and succulent foods will aid them in keeping up a full flow of milk. They should not be turned out before the sun has been up some time on frosty mornings, as frozen grass is good for no kind of stock, neither is the tread of the foot of cow, horse, or sheep, good for frozen grass.

SHEEP are, we hope, on most farms up to their breasts in rape. If farmers will not sow this marvellously useful plant, we cannot be accused of having neglected our duty of pushing its claims on their attention. We have written scores and scores of articles upon it, during the last eighteen years, in this periodical, beginning with the month of June, 1879, and we shall persist in working away in its favour as long as our

--probably from having, in former days, been pretty successful in that line--; but as a regular thing on the farm, unground grain we fancy would pay better.

**PROGRESS OF AGRICULTURE AND COLONIZATION.**

The following is extracted from the annual report (1896) of the Lake St. John Railway:

Satisfactory progress has been made during the past year in the settlement of the Lake St. John district. Many new settlers and their families have gone into the country and taken up land. The Government steamer on the lake has been kept busy transporting them to the different townships in the district. The system of farming is being improved, and the development of the dairy industry has been quite remarkable, the quantity of cheese and

turning under a green crop. I will bear the matter in mind and let you have a short article on the subject at an early date. I further purpose writing an article on the comparative values of roots and ensilage, since it is a matter which at present is attracting a good deal of attention, especially in your province.

Yours faithfully,  
FRANK T. SHUTT,  
Chemist, Expl. Farms.

**HUMUS IN THE SOIL.**

(Continued)

**Mechanical effect—Retains water—Makes land permeable—Temperature equalised.**

In last month's issue of this Journal we considered the origin and composition of soil humus and showed how that

a large quantity of water makes this vegetable organic matter valuable in increasing the retentiveness of light soils for moisture. When the percentage of humus is small, large crops on sandy soils can only be obtained in seasons of abundant rains. Of late years, progressive agriculturists have begun to recognize that the crop-yield is in many instances directly proportionate to the supply of water available for plant use. Hence the desirability in many districts of irrigation. If we can conserve moisture by the addition of humus, we are in a measure independent of the season, and there can be no doubt that lucrative harvests have been obtained from sandy loams in years when otherwise there would be but a scanty growth, simply by the enrichment of the soil with this material in some form or other.

Secondly, Humus improves the condition of heavy clays and also light sandy soils. In the former it lightens and ameliorates, allowing air and water to freely permeate the mass of soil and encouraging root extension. In the latter, it increases the soil's consistency, making the texture closer and firmer and, by binding the soil particles, makes it better adapted to the growth of most farm crops.

These remarks, it must be understood, refer to a right proportion of humus. There is such a thing as over doing it, especially where the soil is too damp and cold to allow of further fermentation. Too great an amount of humus tends also to straggle rather than grain production.

Thirdly, Humus assists in equalizing the soil's temperature. This comes about through its property of holding water. A sandy soil without humus attains a degree of heat at noon on hot summer days that is disastrous to young vegetable life. Such soils, when treated with humus in some form, are rendered distinctly cooler, resulting in much benefit to the crop.

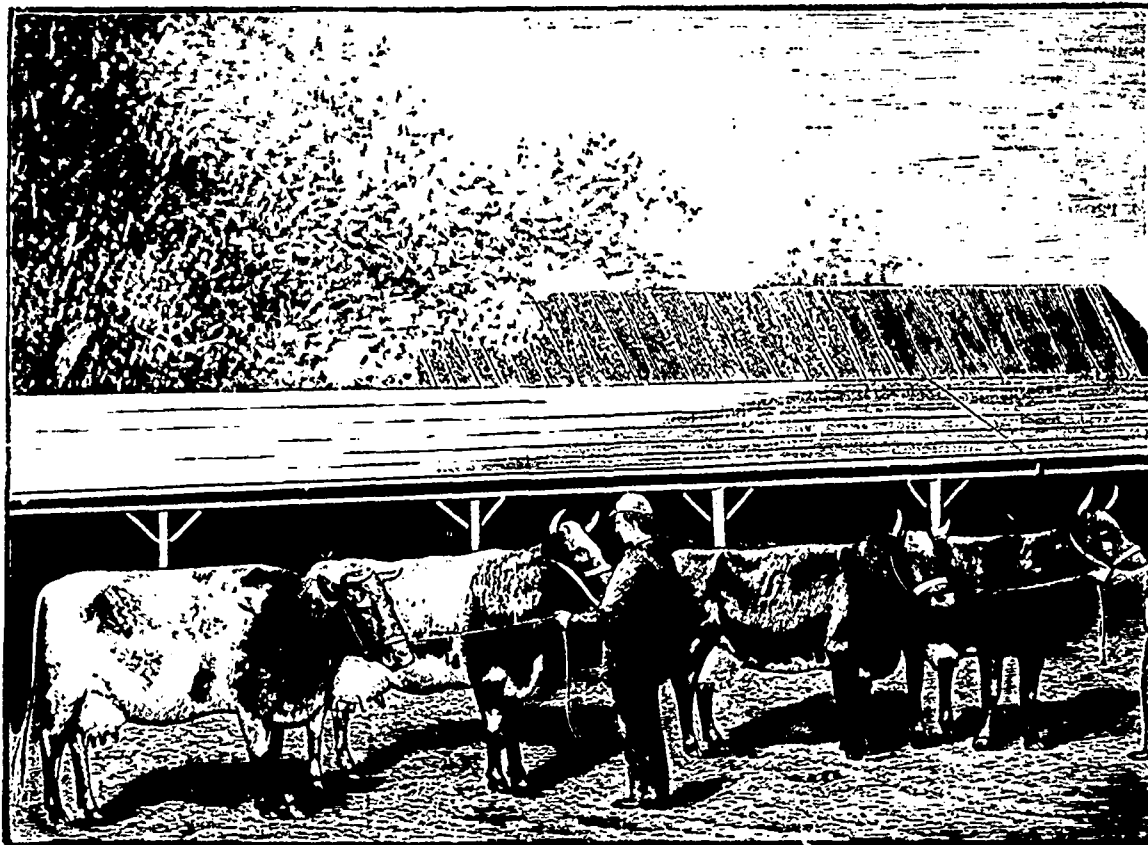
We may summarize the chief mechanical effects of humus, therefore, as follows:—

1. It increases the retentiveness of light soils for moisture and certain elements of fertility.
2. It lightens heavy plastic soils, rendering them mellow and permeable and allowing a greater freedom for root growth.
3. It serves to bind sandy soils, giving a finer and closer texture.
4. It regulates the extremes of temperature, and from this point of view is especially valuable to sandy soils, which at certain times are apt to become over heated.

**FALLACIOUS FOOD VALUES.**

**Errors of analysts—Warrington on albuminoids—Feeding ration.**

Of late we have been frequently reminded that scientific doctrines, however authoritatively they may have been laid down, are to be accepted only tentatively, like other decisions of human judgment based upon existing knowledge, and as conclusions liable to be upset or modified by advancing investigation. More than three years ago, Mr. R. Warrington gave reasons for distrusting the existing methods of analysis used for determining the proportions of carbohydrates and fibre present in foodstuffs, and in the August number of the "Agricultural Students' Gazette"



CROSS-BRED DAIRY SHORTHORN COWS.

The property of Mr. W. Merry, Southcourt Farm, Leighton Buzzard. Winners of Six Prizes, value £65, at Tring Show Milking Trials and Butter Tests.

connexion with the Journal continues, which, at our advanced age, cannot be very long.

SWINE are, as usual, "shacking" in the stubbles, where grass-seeds were sown; the naked stubbles having, we trust, been worked for the following crops to be sown in spring. The newly farrowed pigs must, as we all know, be carefully looked after towards the end of the month, the least chill affecting them seriously. After weaning, which should never be done until they are at least six weeks old (or 8 weeks as we Englishmen used to do), it would be well to give them a few pease as soon as they are able to crack them. It is very doubtful if grinding grain for hogs pays; miller's toll, journeys to and from the mill are serious charges on the value of the grain at present prices. If all the pease, corn, etc., are not digested by the young and the fattening hogs, the lean ones in the yard will give a good account of them. Were we getting up a lot of pigs for exhibition, we confess we should grind their food

better carried by the railway having been 1,340,000 lbs., as compared with 1,114,000 lbs., during the previous year.

Ottawa, Sept., 11th., 1896.

Arthur R. Jenner Fust, Esq.,  
1, Lincoln Ave.,  
Montreal.

MY DEAR SIR:—

I enclose you herewith a further contribution on the subject of soil humus. I purpose bringing this subject to a conclusion in the October issue of the Journal.

There seems in many quarters to have been a misconception as to the results I obtained in our experiments in drying out manure. I purpose, therefore, shortly writing an account of these experiments, explaining fully what we did and the conclusions that we were able to draw from the results.

I notice on page 54 that you ask me to answer a question respecting the probability of acid being developed by

its further decay much available plant food was furnished to growing crops; in fact, we learnt the important chemical functions that this semi-decomposed organic matter performs in soil enrichment.

To-day we shall enquire as to the effect of humus on the tilth of soil—both heavy and light, and, in a future number, as to the more common sources that the farmer may draw upon for a supply of this material.

The three chief factors conducive to luxuriant growth are:—(1) the presence of available plant food in the soil, (2) favourable climatic conditions, and, (3) good tilth, or in other words, a right mechanical condition. We do not say that these three are all equally important, but we do say that all are necessary for the best returns and, therefore, all are deserving of our closest consideration. Since humus plays a very prominent and valuable part in soil texture, it would from this standpoint alone deserve attention.

First, its power to absorb and retain

he has given equally strong reasons for discrediting the usual reckonings as to albuminoids and fats. He begins with the startling declaration that "chemists have at present no means for determining the quantity of albuminoids in any food," thus, in a line, impugning the trustworthiness of all the numerous prescriptions for feeding based on the supposed albuminoid ratio. He explains his announcement by pointing out that in all food analyses the quantities of albuminoids are supposed to be proportionate to the quantities of nitrogenous substance contained, and that this substance contains a certain percentage of nitrogen; whereas some of the nitrogenous substances in food are non-albuminoid, and the percentage of nitrogen in different kinds of albuminoids varies considerably. When the general lines of food analyses were laid down, Mr. Warrington further explains, analyses of albuminoids made up to that time showed a variation of only from 15.5 to 16.5 in the percentage of nitrogen; also that Mulder, then a high authority, taught that all the albuminoids of plants and animals were molecules of a single substance, which he called "protein", and that this contained 16 per cent. of nitrogen. This percentage was therefore adopted as representing the proportion of nitrogen in normal albuminoids, and the nitrogen in supposed albuminoid food was multiplied by 6.25 in order to get at the weight of albuminoids present. Modern investigation, however, has shown that this calculation rarely gives correct results, and that the errors are sometimes great. The percentages of nitrogen in different albuminoids vary considerably, particularly in those stored up in the seeds of plants, and as the case at issue is less complicated in relation to seeds than to other kinds of food, Mr. Warrington first gives the results of recent researches in this direction.

An extended investigation carried out by Dr. T. B. Osborne, of the Connecticut Experiment Station, and still in progress, is referred to as throwing much light upon the question under consideration. The results show that it is rare to find a vegetable albuminoid containing as little as 16 per cent. of nitrogen, and several different kinds are mentioned in which the range of nitrogen percentage is from 15.68 to 19.30. It is clear, therefore, that the weight of albuminoids cannot be ascertained by multiplying the nitrogen in them by a single factor. Unfortunately, it is a difficult task to ascertain the quantity of albuminoids accurately, even in the simple case of a ripe seed. Before even approximate accuracy can be ensured, it will be necessary to make numerous analyses of each kind of seed, in order to get an average result covering possible variations. In respect of some seeds Osborne's investigations have been sufficiently complete, Mr. Warrington concludes, to allow of an approximately exact calculation. Five kinds of albuminoids are given for wheat, making together 11.5 per cent., and the percentage of nitrogen in the whole of the albuminoids is 17.6. The albuminoids in wheat are named Gliadin, Glutenin, Edestin, Leucosin, and Proteose, the first two making 10 out of the 11.5 per cent. of albuminoids found. According to the figures just given, the nitrogen in wheat should be multiplied by 5.68, instead of by 6.25 as at present, to get at the quantity of albuminoids. In the case of maize, there is less complication, as its albuminoid, Zein, occurs in greatly preponderating proportion, and

the multiplying factor in this case is 6.10. Oil seeds contain albuminoids particularly rich in nitrogen, and the factor given for converting the nitrogen of linseed into albuminoids is 5.5. Investigations as to other oilseeds are not yet complete, but are expected to give results very close to those of linseed. Barley and oats, too, are still to be tested further, though Dr. Osborne expects to show that the multiplying factor of the former will be about 5.3, and that of the latter about 6.

Considering that, even when Dr. Osborne's investigations have been completed, it would be rash to accept his results as accurate unless they are confirmed by other chemists, it is obvious that there is a very wide field for research in relation to the albuminoids of food. But, accepting them provisionally, as at least more entitled to credit than those for which they are substituted, Mr. Warrington gives an example of the extent of error for which the present method of reckoning albuminoids is responsible. In the case of a Western American linseed cake, he says, certified by the present method of analysis to contain 38 per cent. of albuminoids, the real proportion is only 31.9 per cent. Nor is this the only error, for as the carbohydrates are reckoned by difference in relation to the albuminoids, if the latter have been put 41 per cent. too high, the former must have been reckoned so much too low. The subject of food values, however, is not exhausted by considerations of the proportions of albuminoids and carbohydrates in food, and Mr. Warrington proceeds to speculate upon the probable differences in the physiological value of albuminoids containing different proportions of nitrogen, suggesting feeding experiments to throw light upon the subject. Again, the subject is further complicated by the existence in some foods of various nitrogenous substances which are not albuminoids, and in such cases Mr. Warrington suggests that, to avoid misleading statements, the term "nitrogenous substance" should be substituted for "albuminoids," the latter term being used only where all the nitrogenous constituents are albuminoids. Mr. Warrington concludes his suggestive article by showing that research to determine the respective feeding values of different fats is as much needed as in the case of the albuminoids, and that the important problem of animal nutrition is in urgent need of the light which can only be thrown upon it by a large number of laboratory experiments.

### ROTHAMSTED EXPERIMENTS.

(Continued)

#### Selection of pigs—Different foods—Increase—Respiration apparatus—Expts on cows, sheeps, &c.—McCaw and Vienna expts—Soxhlet's expts.—Recalculations.

Further, it was maintained that, in the case of pigs fattening rapidly on their most appropriate fattening food, the amount of fat stored up in proportion to the amount of fat and nitrogenous substance consumed was so large that the question of whether or not the carbohydrates contribute to fat formation might be conclusively settled by a properly conducted feeding experiment with those animals, without any analysis of the faeces or the urine, or any determination of the products

of respiration. I stated that it was only necessary to select two animals of a breed of good fattening quality and as nearly alike as possible in character and in weight, a convenient size and weight being, say, about 90 pounds per head. Each should then be fed with ground barley of good quality, giving it by degrees, until both weighed about 100 pounds. Then, slaughter one and determine its total amount of nitrogenous substance and of fat. Continue to feed the other with barley meal (and water) exclusively, as much as it will consume, until it reaches a weight of about 200 pounds; then slaughter and analyze it as the first. The quantity and composition of the food must, of course, also be determined. Such an animal would probably consume about 500 pounds of barley and increase in live weight from 100 to 200 pounds in from eight to ten weeks, more or less, according to the quality of the animal, the quality of the food, and other conditions. It was desirable that the animals selected should have been feeding on fairly good food previously, so that the transition to full fattening food should not be too sudden. It was also, of course, desirable that the experiments should be made in duplicate if possible.

In the discussion which followed Professor Henneberg, who was, I believe, the first to have a Pettenkofer respiration apparatus constructed for experimenting with the larger animals of the farm, and had, perhaps, at that time conducted more experiments on feeding than any other agricultural chemist in Germany, said "he did not doubt the formation of fat from carbohydrates in the case of pigs." He added that probably sooner or later the carbohydrates would be restored to their former position so far as fat formation in other animals was concerned, for already some experiments had shown that such formation was quite close upon the limits of the amount possibly derivable from the fat and albuminoid matters of the food. Prof. Emil von Wolff also spoke in the same sense, so far as pigs were concerned.

Since that time, experiments have been made on the subject in Germany with various animals; but, even in those with pigs, the conditions above indicated as desirable, with a view to obtaining decisive results the most easily, were not followed.

Experiments were made with cows, by Voit at Munich, (1) by Wolff at Hohenheim, (2) and by G. Kühn at Mookern, (3) in those at Munich and at Hohenheim, the amount of fat in the food and that possibly derivable from the albumin consumed very nearly corresponded with the amount of fat in the milk. In the experiment at Mookern, however, a small excess of milk fat was produced. None of those experiments, therefore, afforded evidence of the formation of fat from the carbohydrates.

In experiments made by Kern and Wattenberg, at Göttingen, (4) with sheep of various ages, in ten cases the fat stored up fell short by 24 to 64 per cent of that which could have been derived from the fatty matter and nitrogenous substance consumed. In one experiment, however, one animal

(1) Ztschr. Biol., 1869, p. 113.

(2) Die Versuchs-Stationen Hohenheim, Berlin, 1870, p. 50; also M. Fleischler in Virchow's Arch. Path. Anat., Band 51, 1870.

(3) Versuchs-Stationen, 1869, vol. 12, p. 451.

(4) Jour. Landw., Jahrg. 20, p. 549.

was killed and the initial composition determined, and the other was fed for ten weeks, and the composition and digestibility of the food were determined. The results showed that 29.4 per cent of the fat stored up must have been derived from other sources than the fat and the albumin of the food; and, even making all allowance for possible error, "it was concluded that fat must have been derived from the carbohydrates consumed."

In other experiments at Göttingen, by T. Pfeiffer and Lehmann, (1) a similar result was obtained with a sheep fed with a considerable quantity of sugar.

In an experiment made by Wolff, at Hohenheim, (2) a young pig was fed for one hundred and eight days with barley and maize meal, with the addition of pure starch. The constituents digested were determined. Referring to the results, Wolff says that, having regard simply to the amounts of constituents consumed, and of increase produced, it is scarcely possible to suppose that the quantity of fat which must have been stored up could have been formed without the cooperation of the carbohydrates. He points out that fat equal to only 29 per cent of the increase in live weight could have been produced from the fat and the albumin of the food, and in this calculation he takes the whole of the albumin as available, without reckoning any to have been stored up. He adds that, according to the percentage of fat in increase in the Rothamsted experiment No. 1, there must have been 60 per cent or more. According to our own calculation of Wolff's results it seems probable that about 60 per cent of the total fat in the increase must have been derived from carbohydrates. It is particularly to be observed that, in the case of this experiment, Wolff concluded that the formation of fat from the carbohydrates might be considered established, not only without any respiration apparatus, but even without any direct determination of fat in the animal.

Wolff quotes the results of experiments with pigs at Moscow, by Tschirwinsky, in 1880-81 and in 1881-82. (3) It was estimated that in the one case 61.6 per cent, and in the other 76.9 per cent, of the fat of the increase must have had its source in the carbohydrates of the food.

In an experiment made with a pig at Vienna by Meissl and Strohmer, (4) it was estimated that 82.2 per cent of the stored-up fat must have been derived from the carbohydrates consumed.

At Brookau, Weiske and B. Schulze, (5) made experiments with geese; and they concluded that in one case 13 per cent and in the other 17.6 per cent of the stored-up fat must have been derived from carbohydrates.

At Peterhof, near Riga, Chandowski, (6) experimented with geese, and from the results concluded that in one case 71.1 per cent, in another 78.6 per cent, and in a third 86.7 per cent of the

(1) Jour. Landw., 1885, vol. 23, p. 337; also, 1886, vol. 34, p. 83.

(2) Die rationelle Fütterung der landwirtschaftlichen Nutztiere, 5te Aufl., 1888, p. 48.

(3) Versuchs-Stationen, 1887, Band 20, p. 317.

(4) Ber. Acad. Wissensch. Wien, 1883, Band 88, Part III.

(5) Die rationelle Fütterung der landwirtschaftlichen Nutztiere, 5te Aufl., 1888, p. 50.

(6) Die rationelle Fütterung der landwirtschaftlichen Nutztiere, 5te Aufl., 1888, p. 50.

stored-up fat must have been derived from carbohydrates.

Wolff also quoted recent experiments by A. von Planta and Erlenneyer at Munich, with bees, (1) in which it was proved "that wax had been formed from sugar."

Lastly, in 1880-81, Soxhlet made experiments with three pigs at the agricultural experiment station at Munich. (2) The animals were five to six months old; they were fed for a preliminary period of 321 days with equal but limited amounts of barley meal. No. 1 was then killed and analyzed; No. 2 was fed for 75 days, and No. 3 for 82 days, with 4.4 pounds steamed rice per head per day for most of the time, but only three-fourths as much afterwards. Meat extract was also given for 50 days. Finally, Nos. 2 and 3 were killed and analyzed. Calculation shows that the increase of No. 2 contained 14.19 per cent of nitrogenous substance and 25.80 per cent of fat; and that of No. 3, 7.25 per cent of nitrogenous substances and 57.23 per cent of fat. That is, the increase of No. 3 contained only half as much nitrogenous substance, and more than twice as much fat, as that of No. 2; and even the higher proportion of fat (57.23) is low compared with that which would be obtained with animals of good breed and rapidly fattened on appropriate food given ad libitum; while the composition of the increase of No. 2, both as to nitrogenous substance and fat, can hardly be called that of fattening increase at all. Still, calculation showed that, of the total fat in the increase of No. 1, 79.35, and in that of No. 3, 81.84 per cent, must have been derived from the carbohydrates of the food.

Notwithstanding the extraordinary difference in the composition of the increase of Soxhlet's pigs, No. 2 and No. 3, after having been fed alike, he says that only our experiment No. 1 is admissible for calculation, because it is only in that case that the initial and final composition was determined in parallel animals. He, in fact, accepts our least conclusive result, obtained with food abnormally rich in nitrogenous substance, and repudiates our most conclusive experiments with appropriate fattening food. Accordingly, he maintains that we had only shown the probability of the formation of fat from the carbohydrates, and that his own results as above were the first to prove it.

I think the discussion of the results of the nine experiments recorded in Table 70 (p. 35-v. August number) must have succeeded to show that in some of them a very large proportion of the fat of the increase to have been produced from the carbohydrates. The mode of calculation adopted showed, however, a maximum amount of the fat of the increase to have been possibly derivable from fatty matter in the food, a maximum amount of the nitrogenous substance of the food to be available for fat formation, and a maximum amount producible from a given amount of nitrogenous substance, and hence, a minimum amount necessarily derived from carbohydrates. But, as the results so calculated, and discussed with due reservation on these points, are those upon which we have for so many years maintained that the formation of fat from carbohydrates has been proved, and as it is those re-

sults, and the conclusions drawn from them, that have instigated so much subsequent investigation leading to the confirmation of our views, I have thought it desirable prominently to direct attention to the evidence as so brought out.

(To be continued)

## The Farm.

### PRACTICAL FARMING.

(by James Dickson, Trenholville).

#### Top dressing meadows—Harvesting turnips—Storing turnips—Top dressing meadows.

With due deference to the opinion of the Editor, I venture to again refer to this subject. It is one well worthy of discussion.

On this subject, in the last issue, while alluding to the experiments, I said that "the manure is placed in a retort, or furnace, and dried perfectly, and done with." (I alluded to the mode in some of the cities in Germany of drying nightsoil for transport). The Editor's note says, "By no means." The experiments of Prof. Shutt were "conducted very differently. Well rotted manure was exposed every day to the sun for a month". On a second look however, it will be observed, that the Professor's method of drying, and that of Germany were alike. That is, as I observed, "dried perfectly, and done with" and consequently, as I observed, "there is no analogy whatever." As it is the continuous waste, the daily southeastisation resulting from the rain and sun, not sufficient to wash the juices into the ground, but the slight wettings sufficient to solubilise a certain amount which is liberated by next days sun and wind. Thus, it will be seen that although Prof. Shutt was quite correct, an experiment made in that way, and also the practice in Germany, does not apply in practical farming. It cannot be desired, that to solubilise the soil, or manure, it is necessary that air and moisture come into contact with it. Dry earth will not grow a plant, nor will dry manure yield its virtue, but the moment it is moistened, a plant can extract from it its strength, and the atmosphere also. Call it suction, attraction, or evaporation as you will. But I challenge to the proof, that in either case the loss is water only.

I trust my referring back to this subject will be excused on account of the vast importance of the matter. There cannot be too much discussion on this subject. And if it causes even only a few farmers to be more careful of manure, and study each for himself where the waste comes in, their example will result in greater success in practice. (1)

#### HARVESTING TURNIPS

(Continued from June Number)

To harvest turnips I have never seen anything to beat the willing "Farmers boy" of the old Country. He seems anxious to get the "dirty job done," and the turnips are pulled and cut with scarcely an interval between the up and down of his back. The secret of the matter being that he "learnt to do it that way".

I have always used a piece of scythe for a knife made in the form of No 2 in

(1) I fear the practice of every English farmer who occupies permanent grass-land is utterly, obstinately opposed to Mr. Dickson's ideas.—Ed.

an article in a late issue of the Journal. A handy farmer can easily make them, and they last a lifetime. The only tools necessary are a hammer, cold chisel, brace and bit. A worn out scythe will do, but a broken new one is much better. It is heavier for the length, and the back is farther from the edge. Make the blade part 8 to 10 inches long, using a piece of the back about 6 inches long for the handle. A piece of dry basswood or poplar makes a good handle. Saw off a block long enough to allow of the end of the scythe-back being bent to hold the handle on. In the rough block, bore a hole to insert the scythe-back, and shape the handle to suit. A blacksmith will do the iron work in a few minutes. With this implement tackle the second row, pull a turnip, strike it back and forth once on the nearest turnip, break the other roots off with the back of the knife, turn the hand towards the score between the second and third rows, and with a slight swing, raise the turnip upwards, at the same time bringing the knife down, cutting the top from the turnip. Throw the top on a pile, also in the same row, separate from the turnips. Thus, there will be a pile of tops alternately with a pile of turnips. The third row will now be handled in the same way, and on the same piles, as also, the first and fourth rows. Again take the second row, then the third, the first, and fourth as before. Thus, there will be the turnips and the tops of four rows in one, and good room for a road between. It is better to cart each day's cutting each evening. "A change of work is as good as a rest." In the ground and with the tops on they stand quite a frost, but from some reason, they do not keep as well if frozen to the same extent when not attached to the ground. Cart the large ones separate from the small and tainted. Observe, I say cart, not wagon, between the two there is a great difference in the labour. (2)

Having disposed of the turnips we will now proceed with the tops. The usual method of turning the cattle into the turnip field to eat up the tops cannot be too strongly condemned. They are scoured, and that for some time after cleaning the field on account of the dirt they have eaten. And I cannot understand where the economy comes, from ploughing them in. I have no experience in that way, but to me it looks like ploughing in a crop of oats or clover, after it is in the cock, in place of feeding it to stock and putting the manure back upon the land. Like the turnip, there is a certain amount of good feed in the top, and properly fed, is a great help while feeding coarse forage. Proceeding on this assumption, put the side posts and boards on the cart, use a two tined fork to pack on the tops, dump in a convenient place to feed to the cattle in the yard, make a longitudinal heap about two (2) feet at the base, tapering to a peak, with a few long leaves thrown across the top. And, observe, if the heaps are made too large they will spoil, properly done, they will keep perfectly. If the field is not required, draw and feed as necessary. There is economy in feeding a reasonable daily allowance on the frozen ground, or in racks, before snow falls. In this, I have endeavoured to describe the method I have practised for decades of years.

#### STORING TURNIPS

Turnips are a heavy thing to handle and everything ought to be made as

(2) Rather 1.—Ed.

convenient as possible, else the extra labour will discourage the cultivator, and draw heavy on the profits of an otherwise paying crop. I remember being taken many years ago into the barn cellar of the largest feeder in the country at that time. In each of the four corners of the cellar, containing about 1500 bushels of turnips, there was a fallow candle and a man with an axe in one hand, and a turnip in the other, cutting for the cattle. There were nearly 100 oxen in the stables, and the four men had all they could do, to "do the chores." But oxen were then five cents a pound live weight, on the spot, and the same class of beef would now scarcely bring more than half of that here. Thus it will be seen there is a need of study as to the cheap production of beef, else "ends won't meet."

Different circumstances suggest different methods, but that of storing the turnips in the house cellar, and carrying them from there to the stable is what very often prevents the more general cultivation of turnips.

It is heavy, unpleasant work. Where there is a barn basement, and the cattle kept there, the matter is easily arranged by having a bin and a trap door in the barn floor. When the basement is used for manure and young cattle, a bin can be made in the same way, but by about Christmas the frost is generally too intense to allow of them being kept there longer. Several loads can be kept in the barn floor for feeding in November. In any case, the small and tainted ones ought to be put there, to be fed in the early part of the season. One thickness on the floor can be sliced nicely with a sharp shovel. The large ones do not require cutting. (1) At first some of the cattle may refuse to feed, but in a short time they will take to them as kindly as a boy to a peach apple, and with as little need of a knife. Sometimes it may be necessary to store the large ones in the house cellar for spring feeding. In that case, it will be found most convenient to bag them, sled them to the stable, and empty as used. It will often be found better to discontinue feeding entirely during the three coldest months. They will thus be fed at the fall end of the season when the coarse forage is being fed, and the winter beef fattened, and again in the spring, when cows and ewes require loosening, and strengthening. I am now referring to a harvest of three or four hundred bushels and if every farmer would arrange to have about that quantity, the convenience (?) of fattening animals in the fall would be very obvious. And many a good cow has been lost in the spring, or the profit of her year's work lost, for the want of a half a bushel a day for three weeks before her calving. The same remark applies to sheep. It is sometimes said "Turnips are not good for horses." (2) Neither are too many apples good for boys. Give the old mare ten pounds a day.

#### STATE OF THE CROPS AND FRUIT.

#### Early harvest—Yield—Frozen corn—Packing fruit—Inspection of fruit—Butter, &c.

Since my last was written, the crops south and west of the city of Quebec have all been garnered in, an early

(1) How about choking.—Ed.

(2) Swedes are at any rate.—Ed.

(1) *Bienenzeitung*, v. A. Schmidt, 1878, p. 151.

(2) *Ztschr. landw. Ver*, Bayern, 1881, pp. 423-436.

harvest. I can remember well when we were to the middle of Sept. often, before finishing harvest, certainly a full month later than this year. Well, the yields of grain have been better than for many years especially in oats. Corn has done well lately, in some sections fodder corn is cut and harvested. I trust that the other corn will be cut before the leaves get frozen, frozen corn fodder is not worth much to feed, certainly not over 50 p. c., of what good green fodder well cured before frost in work.

APPLES, are some thing like the oat crop seldom has there been such a yield.

The next question is how to dispose of them to the best advantage, that is the great question. Great Britain can take lots of apples, but they must be properly packed and only good ones sent over, better to dump the poor ones in the St. Lawrence River than to send them over to hurt the sale of the good ones. Packers must be extra careful in sorting and put in only uniformly good fruit, not the fine being apples at the end and only trash in the middle. In apples as in everything else when the price is low only the best can be sold at a fair price, it is to be hoped that there will be some sort of inspection before shipment or some one will come to grief. Send only good fruit of the kinds that are best liked. try and not ever stock the market—in such a case we should receive something for our surplus apples this year.

OTHER FRUITS seem to be as plenty as apples and of fine quality.

BUTTER AND CHEESE: The butter market, worked along finely until recently when there was rather heavy shipments; prices declined consequently, but it is now seeming to recover somewhat. Prices are 17½ to 18cts.

CHEESE, has been booming for some time, care will have to be taken not to force matters too far. 9 to 9½ seems to be the range at present about 2½ more than this time last year.

Fall ploughing has hardly begun, some have turned over fields to be again reploughed later this fall or next spring, try farmers and get your fields turned over this fall (1) in order to get your sowing done early, as only early grain nowadays amounts to anything.

PETER MACFARLANE.

Chateauguay, 10th Sept. 1896.

## POTATOES: DEEP OR SHALLOW PLANTING.

This question is not easily determined, as various conditions will, unquestionably, affect it very much. There can be no doubt that, where soil moisture is abundant, shallow planting will be safer than where there is a scarcity of the same. It will also be found that where moisture is either abundant or over-abundant at the time of planting, the results from shallow planting will be more favorable than when the opposite conditions prevail. On the other hand, deep planting except in times of excessive rainfall, will undoubtedly be safer in the average season, as where potatoes are put well

down they are, to some extent, fortified against a dry season.

Shallow planting is also less favorable to harrowing soon after the potatoes are planted. This is very important, as then it is that weeds can be most effectively killed. If the potatoes are near the surface, there is much danger that the harrow teeth, if at all long, will drag out the tubers. On the other hand, if they are well down the harrowing may be done at least, as much as is necessary without any hindrance from the source named.

Another evil resulting from shallow planting that the tubers come up too near the surface of the soil; hence a considerable proportion of them become affected with sun scald. The proportion thus affected will be very much greater in the case of the potatoes of shallow planting than in those planted more deeply. In fact, it is liable to be so great as to materially affect the value of the crop.

Experiments conducted to test this question have resulted variously. In some instances the deep planted tubers have given the best results; that is to say, those planted as deep as six or seven inches. In other instances those of intermediate depths have done the best—that is to say, those planted from three to five inches, but in no instances, so far as known to the writer, have the best results been obtained from those planted nearer the surface than three inches. As potatoes planted quite near the surface have a tendency to form tubers further from the surface, and as the potatoes planted seven inches have a tendency to grow tubers a little nearer the surface, the lower intermediate depth would seem to be about the best depth at which to plant them.

"Farming."

## DIVISIONS.

Utility of numerous divisions of land on the farm—Best kind of fences—Hedges—Injudicious advice about treatment of foals.

September, 5th 1896.

DEAR SIR,

When I first tried farming I thought it would be a great thing to do away with all fences, not absolutely indispensable, and accordingly pulled down several ones, that were on the farm when I came, instead of repairing them. Now, I am putting up again every fence that I pulled down and adding several new ones that were not in existence before. The advantages of having numerous well fenced divisions on a farm, I now consider to be worth much more than the cost of putting up the fences. In economy of pastures, for instance, to mention one thing only, how much waste is prevented, by having one pasture well fenced, before turning stock into another. The amount of grass that cows will waste, by being allowed to run over a large pasture, not properly divided off into different fields, is astonishing. I have built many different kinds of fences, barb wire ones, of course always excepted. From my own disagreeable experience, having been caught in one, out hunting, and suffered injury both to man and beast, and seen countless injuries to stock on farms, fenced in this way, I do not want any barb wire

fences, on my own, or any of my neighbours' farms, no matter how little they may cost to put up. Passing in a train, I have several times seen a poor horse down in a ditch, with several coils of barbed wire round his legs, cutting the flesh to the bone, and with no prospect of deliverance for goodness knows how long. I have never met with a man yet, with barb wire fencing in his farm, who could not furnish me with at least one instance in his experience of injury to a horse or foal. The fence, I like best, and which is not too expensive for a good fence, is one made of round peeled cedar posts, moderately thick, sunk in the ground, at intervals of 6 feet, with three holes, bored through the centre and large sized single, or smaller sized 2 ply wire drawn through and properly braced. There is no pulling out of staples in this fence and it is as strong on one side, as the other. A cedar rail, if they can be had cheaply on the farm, should be nailed on top of the posts, if not, a 4 inches rough inch board of spruce, on the side, and another on the top, can be nailed on very quickly. If there are loose stones about, to be got rid of, they can be made into a low wall, of 18 inches or 2 feet high between the posts, and only 2 wires need be used. This fence has one disadvantage. It does not stop the snow enough in winter. This may not be missed, in a public road fence, where you do not want snow banks to accumulate, but it is a very serious one in a field fence, that will collect a good mound of snow during the winter, and you are pretty sure to have a good bit of clover or timothy, there next season.

In order to be perfect, this fence should have a hedge of spruce, cedar, or Canadian thorn, on one side of it. In time, if you plant the thorn, and make it thick and strong at the bottom, by cutting down, it will make a complete fence, of itself, and you can take up the posts and put them somewhere else. You can, if you like, make as good a hedge with the common thorn, which grows about our farms in scrubby, rocky pastures, and alongside line fences, as any black thorn hedge in England. It may not be quite as ornamental, or as strong, but it will be strong enough, if you keep it cut down properly, and more useful, because it will collect the snow in winter. It will grow thick and strong enough to make a much stronger fence than any ordinary cedar rail fence that we see about the country. It takes, of course, a little time to grow, but once to the requisite strength and thickness, it needs no repairs, nothing but cutting down to the desired height, and trimming, which takes very little time, and is very easily done, and will last for ever. I can show anybody who cares to see it, a fence, nearly all of Canadian thorn, over thirty years old, that will turn any animal, even of the most enterprising nature. It is not so thick, as it might be, at the bottom, because it was allowed to grow nearly to the height of 15 feet before it was cut down, but that is a mistake that can easily be avoided. Without taking away in the least from the utilitarian point of view, upon which, alas, the farmer is obliged to concentrate his vision, even were not other useful objects attained by it, the addition or substitution of live fences would add enormously to the attractive aspect of a Canadian farm.

The aesthetic element in the look of a farm has its practical and utilitarian

aspect, even for the farmer, as that tells, when you want to sell a farm. Other things being equal no man would hesitate about buying a farm of an attractively picturesque aspect in preference to another much inferior in this respect.

Beautiful, well-trimmed hedges, in the absence of natural picturesque scenery and fine trees, do more than anything else to make cultivated rural scenery attractive. Talking of beautiful hedges, our new minister of agriculture has a hedge of Norway spruce which must be seen to be appreciated. It is about 9 feet high and 7 feet thick, and a bird could not fly through it.

Along many division fences between our fields, in the Province of Quebec there are many thorn bushes, that have seeded themselves, growing at intervals. In this case, almost half the hedge is already started, and you have only gaps to fill up. This can be done in the late autumn; loosen the earth round thorn bushes by the road-side, in scrubby brush, or wherever you can conveniently find them, no matter how long time yet, will object to your taking them away, if not on your own land. Lie a rope round them, pull them up with the aid of a horse and whiffle-tree, fill a hay cart with them and put them in the gaps, and you will soon have a fine hedge, which you can trim as square at the top and sides as you like, very rapidly, and with very little trouble, with a sort of bill-hook at the end of a two foot size wooden handle, which you can yet at Mr. Ewing's, and with which you can do good work, when once accustomed to its use.

Would Mr. Moore kindly give in the October number, or this, if possible, a few simple directions for the setting out of hedges of thorn, as practised in England. The same methods would be perfectly applicable to the setting out of the Canadian thorn.

In the French edition of the Journal for July, I notice an extraordinary bit of advice, under "Farm work for August," I read, "Sevrer les poulains et leur donner une nourriture suffisante pour qu'ils ne périssent pas" what sort of a horse would you expect a foal to grow into, that had to be weaned in August? This would mean, as a rule less than three months with the dam, and how about late foals? which for reasons of farm economy the farmer is sometimes advised to breed?

If you want to breed a good horse, a foal should be with its dam for 5 months at least, 6 is better, and additional food should be given to the dam as soon as pasture gets scarce, or that she falls off in milk. The French Canadian farmers have an idea, and have often expressed it to me, that a starved and stunted foal, will improve and grow into a fine animal if he is well fed and taken care of afterwards. This is entirely erroneous. It may be laid down as an absolute axiom in horse breeding that it is most important that a foal should be well-treated and fed from the start, until at least 2 years old. They may stand a little hardships afterwards, if they have been well-cared for up to this age, although it is of course much better not, but if starved and neglected during early youth, no amount of after care and attention will make up for lost ground. If by chance a neglected foal turns out a fair horse, he would have made a much better one, had he not been so treated.

C. F. BOUTHILLIER.

**CULTIVATION OF MANGELS.****Value of the root—Preparation of land—Sowing—Thinning—Harvesting.**

The growth of mangels should form one of the leading items of cultivation on all farms where animals are kept, on good land with skilful management the amount of food produced is far greater in proportion to the labor and expense than can be obtained in any other way. The yield per acre, under favorable circumstances is larger than that of any other root, its feeding value is much greater than that of turnips. Three hundred and forty pounds of mangels are equal in feeding value to one hundred pounds of the best hay; eight and a half tons have the same nutritive value as have two and a half tons of hay; twenty-five tons of mangels are not an unusual crop per acre. The labor required is much greater than is required for the hay, but it bears no proportion to its superiority in feeding value. In addition to their nutritive elements, they are a fresh and succulent food that may easily be kept the whole winter. They have the effect of keeping the animals in a more healthy and better lubricated condition and greatly stimulate the thrift and growth of stock.

The preparation of the soil should be the perfection of cultivation thorough drainage, natural or artificial, deep cultivation and rich manuring, are all necessary for the best results.

The writer has found the preparation of the ground in the fall attended with the best results. Left in drills thirty inches apart, the action of the frost leaves a fine seed-bed, and as the crop requires the whole growing season for its perfection, the seed should be sown as early in Spring as possible. The crop may require a little more weeding than if cultivated in the Spring, but the extra crop will more than compensate for the labor. If sown with a machine, six or seven pounds per acre will be required, but if sown with a one half that quantity will suffice as the seed can be put in the drills about twelve inches apart and should be thinned to a single plant when two or three inches high. The only attention after sowing and thinning is keeping free from weeds, which is best done by horse and hand hoeing, as the preparation of the ground should be all done before sowing.

Harvesting should be done before heavy frost, as frost destroys the keeping quality of the root and the tops should be broken with the hand and not cut, (1) as cutting induces early decay. They should be stored in a root-house as near to the stables as possible to save labor, and kept as cool as possible but not allowed to freeze, thus kept they will be just as good in April, as when stored.

(Signed) W. H. TRENHOLME.  
Langue-Pointe.

**CULTIVATION OF CARROTS.****Preparation of land—Drills—Seeds—Hoeing.**

In preparing the ground for carrots, I begin to plough as soon as possible after I have finished harvesting, gene-

(1) Good.—Ed.

rally about the middle of August, ploughing from six to seven inches deep. Then about the middle of October if the weather is dry I pass the heavy cultivator around, then the harrows so as to bring all the weeds and grass to the surface, which I gather together and burn. Then about the first week in November, I plough again, setting the furrow well up on edge, so that the frost may, thoroughly pulverise it. Then in winter and early spring I draw a lot of liquid manure in a sleigh and wagon that we have specially made for it and let it run evenly all over the ground.

I find that liquid manure grows stronger tops and heavier roots than any artificial manure that I have as yet tried. About the first week in May I pass the harrows over the ground to break and level it, taking the drill plough I open the drills twenty six inches apart, filling them with well rotted farmyard manure at the rate of twenty-eight to thirty tons per acre. Then passing with the drill plough I cover the manure drawing the drills well up to a point, and pass the light circular harrows taking two drills at one time so as to get a fine mould to cover the seeds. Now I pass the drill seeder along the drills sowing from four to five pounds per acre covering the seed to a uniform depth of half an inch, then pass with a light roller so as to firm the ground, the seed. Care should be taken that the warm weather has fairly set in before seeding or else the seed will be long in germinating. I some times mix the seed with damp sand two days before sowing so as to hasten its growth. As soon as the plants are two to three inches high I thin them out four to five inches apart, then about a week after thinning I pass the light cultivator between the rows too loosen the soil and kill the weeds, taking care to single out any doubles that may have been left in the first thinning. Then I pass the drill plough putting the earth well up to the carrots, so as to keep the dry weather from getting at the roots of the carrots, I find that for horse feed I can grow nothing on the same size of ground, that equal carrots, but like all other field roots, they want thorough cultivation and plenty of well rotted farmyard manure.

ALEX. B. STALKER,  
Farmer for Dawes and Co  
Willows Farm,  
Lachine.

**Correspondence.****Orchard-grass—Hungarian-grass—Reply.**

St. Fables, 8th Sept. 1896.

Mr. Jenner Fust, Esq.,

Montreal.

DEAR SIR,

As I intend preparing a piece of land for two crops for next year, I solicit your advice as to which would be the best seeds to use.

My intention was to sow Orchard Grass first, and cut in June, and then resow with Hungarian-grass.

Please advise me as to best way of preparing land and as to time of sowing and cutting.

I intend trying two crops as an experiment, and if successful will report to you. (If spared to do so.)

As a Subscriber to your Journal I

think your articles are a great benefit to those who wish to improve in agriculture.

Yours truly,  
D. A. McDONALD.

REPLY: The above is a very difficult question to answer. Why sow so expensive a seed as Orchard-grass? At least three bushels an "arpent" would be necessary, if sown above, and it costs 15 cents a pound, that is, about eight dollars an acre! Would it do anything to speak of in the few weeks between May 1st and August 1st, after which Hungarian-grass is not worth sowing for hay? Again, nothing is said about the use to be made of either of the grasses! If we were sowing orchard grass, we should put it in, with the great clover, with the barley in spring, and let it stand for two or more years. The beauty of this grass is that, unlike timothy, it may be mown for green-ward, or for hay, or fed off, just wherever it is wanted, as it is never injured by close-cropping; in fact, it must never be allowed to stand too long, as it soon gets woody. We should prefer sowing a mixture of vetches, oats, and pease: say, 2 bushels of oats, 1 of pease, and 1 of vetches to the arpent. This crop may be cut green for fodder, or made into hay and follow with either white-turnips, rape, or Hungarian-grass for pasture. We hope to hear again from Mr. Macdonald.

**CROPS IN METIS, &c.**

Mr. Jenner Fust,

DEAR SIR,

In endeavouring to give you some information about the crops etc., I am labouring under somewhat of a disadvantage, as I have not been through the country much this year, but from what I can learn the meagre information I give you is about correct.

Hoping this will be of some use to you, and trusting you are enjoying good health I remain,

Yours truly,  
S. MACNIDER.

**Grain and Hay crops—Potatoes—Factories—Butter.**

Little Metis, Sept. 2nd 1896.

The crops in this district, especially the grain crops, are not so good as those of 1895; the hay crop, though, is an exceptionally good one; warm showers during the month of June and July having greatly favoured its growth; on newly seeded lands especially, the yield was very satisfactory. Pease are very poor this season, wheat oats and rye doing fairly well. Potatoes are looking very fine, and from all appearances there will be an immense yield.

Notwithstanding the discouragingly low prices booked for them last year, the farmers took advantage of the immense shoals of herrings caught during the spawning season to manure their land, and planted an unusually large acreage in potatoes.

Turnips and carrots, although not cultivated to such an extent, look healthy and vigorous.

Butter factories in the neighbouring parishes are doing a pretty good business. Farmers are realising more and more that it pays to give their milk

cows better food, and they are endeavouring to keep better stock.

Butter fetches 20cts (1st class table butter) during the summer months, as the farmers find a ready market in Metis in the visitors that come here. Cooking butter sells for 15 and 16 cts.

S. M.

**The Grazier and Breeder.****DEVON CATTLE AT HOME.**

(By James Wood)

"Eds. Country Gentleman"—Two weeks' coaching through Devon and Cornwall has given extended opportunities for seeing the cattle and sheep of the whole region. The Devon cattle are not by any means confined to the county from which they have taken their name, but are found in great numbers in Somersetshire on the one hand and in Cornwall on the other. (1) All these counties have excellent grass, and a smaller proportion of the land is devoted to grain crops than in most other sections. This is in part owing to the character of the soil and in part to the humidity of the climate, which is very favorable to a thick and excellent growth of grass. There is, however, great variety in the elevations and fertility of different sections. In Devon are the high, rough and poor tracts known as Dartmoor and Exmoor, and also the beautiful and most fertile Vale of Devon, often called "The Garden of England;" while in Somerset is the equally fertile Cheddar Valley, famous for the unrivalled excellence of its cheese.

On the rich pastures of Somerset, long before we get to Devon, are to be seen great numbers of the beautiful red cattle whose high quality has caused the Royal Agricultural Society to place and keep this old established breed at the head of its list. If there is anywhere a more beautiful sight for the lover of cattle than a hundred or more fat Devon bullocks in a rich interval pasture, I do not know where to look for it. Uniform in everything—size, color, heads, horns, straight and broad backs, round barrels, even the switches of their tails—they fit the landscape and please the eye as none others can. Beautiful as are the fattening animals, there is greater interest to me in the Devon dairies. The milk cows show a milk-producing quality we do not expect to see in a breed whose beef qualities have been so highly developed. But in this most American observers have been misled with this breed, as we have with Durhams, because prize show animals of the beef type have usually been selected by our importers, and because in these breeds we have almost exclusively looked to beef production, giving attention to other breeds for dairy purposes. But it is a fact that THE GRADE-SHORT-HORN, IS STILL THE CHIEF DAIRY COW OF ALL ENGLAND, except in this southwestern portion, where the Devon holds undisputed pre-eminence. Their quality is attested by the great reputation of the butter and cheese made from them and by the indescribable excellence and delightfulness of "Devon cream." This is a scalded cream whose prepara-

(1) The "Somerset reds" are coarser than the true North-Devon, but capital dairy-cattle.—Ed.

ration is beyond my ken, which is used with fruits and as a sauce, and for which this region has long been famous. (2)

**REARING STOCK ON A DAIRY-FARM.**

**Suckling calves—Autumn treatment—Carbolised powder—Drumhead cabbages—Selection of cows and bulls—6 calves reared from 1 cow—Calf meal—Milk-fever.**

(We agree thoroughly with Mr. Hobbs in all that he says, except that we greatly prefer taking away the calf from the cow at once; even before she has seen it, if possible. Ed. J. of Ag.)

Mr. James T. Hobbs, Maisey Hampton, Fairford, Gloucestershire, read a paper at the Dairy Farmers' Conference, at Wrexham, on Wednesday, of which the following are the principal portions.—

The rearing and breeding of dairy cattle having been written and spoken on by so many people more experienced and better qualified than myself, it is with diffidence that I venture to place this paper before such an accomplished and influential body as the British Dairy Farmers' Association.

I shall not attempt to approach my subject from a scientific standpoint, but shall place before you some facts and matters that have fallen under my notice in the management of a large herd of pure-bred dairy Shorthorns. My custom is to allow the calf to suck its mother about a week or ten days after birth; it is then taught to drink from a bucket. A liberal allowance of milk at first being given, this is gradually decreased, and a calf-meal substituted. Mine is home-made, at a less cost than many of the calf-meals and spices can be bought at on the market. Many people prefer taking the calf from its mother immediately after birth; the calf at that time is taught to drink more easily, and the process of weaning is more easily accomplished. I do not think it makes much difference whether the calf sucks its mother or drinks from a bucket, so long as it has a sufficient quantity of milk. Nothing will do for the young animal so well as pure milk. In the case of cow calves it is not necessary, or at all advisable, to make them fat, as in doing so you decrease their milking properties and make them more uncertain breeders. The cow calves that are dropped in the autumn and early part of the year are turned into the grass fields the following summer, and given about 2 lb. of linseed or corn meal. I find the animals so treated do far better the second year than those kept in all their first summer. The younger cow calves are turned into the orchard by day and taken into an open yard at night. Great care must be taken in keeping the young animals in a healthy state, as nothing is more conducive to "black leg" or "murrain" than at one time stinting and at a later period over-feeding your calves. Avoid putting the calves on aftermath. By keeping them on the grass land that has not been mown, I consider you suffer less from "hoose" or "husk". The end of September, the calves should be had in at night, and given more dry food. Nothing is more wasteful than allowing animals to remain on the pastures late in the autumn without as-

(2) We have made lots of "Clotted cream" in our time, and butter from it too.—Ed.

sistance, and losing much of the flesh they have gained during the summer months. The second year the heifers are turned into the pastures, and should thrive on fairly good land, if not kept too thick, without any artificial assistance. I think moderate numbers carefully tended pay better than being over-stocked. I prefer to have the heifers calve at two and a half years old; they are more likely to become regular breeders, if brought into the dairy early, and in the end will make better milkers. If you consider your heifer small and weak, do not milk her too long, and let her have a little rest before she comes into the dairy with her second calf. The animals that are pregnant, and especially the young ones, should receive special care and attention. If the mother is in poor condition when she calves, she certainly cannot milk so well, and there is a danger of losing her altogether. Great care must be taken with the older cows to guard against milk fever and drop. Many are the suggestions and remedies, but after every precaution has been taken cases will occasionally, and sometimes frequently occur. Fasting and physic of a purgative nature, bran mash, and avoiding as far as possible draughts, help to ward off this dreadful malady.

After your cow has presented you with a calf, she cannot be treated too kindly. The better she lives, and in winter the warmer she is kept, in reason, the more milk will she give. In the winter months my cows are all tied up by the neck, standing on a brick floor with a gutter at the back, the manure is carted out each morning and put straight out on to the land, my experience is that this green manure is most beneficial, especially on grass land. A little carbolised powder sprinkled into the gutter keeps your houses sweet and tends to keep away disease. The cows that milk well are allowed about six pounds of artificial feeding-stuff per day, anything that is a good milk producer and, if possible, cheap. They also have pulped mangels and chaff mixed and one meal of hay. Drumhead cabbages are grown for autumn and early winter feeding. On heavy clay or any deep soil they produce an immense weight of keep per acre. I plant them a yard apart each way, so that they may be more easily horse-hoed. Rye is planted in the latter part of September for spring feeding. It is well to have two sowings if possible, as the one will follow the other. My cows and nearly every horned animal on my farm had a liberal supply of green rye this spring for a month; it saves an immense amount of hay, and prepares your animals for the young grass when they are turned out to the grazings. In spite of what some friends suggest to us, it is a happy day to the dairyman when his cows are turned into the fields to seek their own living, and he indeed must be a hard-hearted man who would deny his cows this pleasure. Few people, excepting those who keep dairy cows, have any idea of the amount of food they consume and the immense labour and expense it is when everything has to be drawn to them. In the summer months, when the cows are at grass, each cow that gives two gallons of milk per day has an allowance of about 4 lb. of cotton cake or some other good milk-producing and economical mixture per day. You will find this system improve your grazings, and more than counter-balance any loss that may arise through whole milk being sold. Each cow should have her milk weighed at least

once a fortnight, and those not giving nearly 6,000 lb. per year should be weeded out. In forming your herd of dairy cattle, after you have made up your mind as to the kind you will keep, buy as good females of that particular breed as your capital will allow. Select cows with nice-shaped udders and teats, well placed, and be most careful to have animals strong in constitution. A cow that gives a good, fair quantity of milk, and, after she has finished her dairy life, rapidly becomes fit for the butcher, is the animal that will generally make the largest returns. (1)

Having got your females together, too much care cannot be taken in selecting your male animal. See for yourself that he is from a dam with good milking properties, as I am certain that milking properties are hereditary. For an ordinary dairy herd do not be too particular about the shape of your bull; buy him long and low, with bold rib and strong loin, masculine head, grand carriage, and have some size about him. Should his offsprings be not a success, do not hesitate to get rid of him, although he may have cost a lot of money and you took every care in selecting him. I do not care how experienced or how good a judge a man can be, he will sometimes purchase sires that are a failure. The young calf should be carefully examined, as a good calf at birth is always likely to develop into a serviceable animal. Milking properties must be cultivated. I do not think the animal can be bred to keep fat and at the same time to be a deep milker, but she should be bred to milk well, and, when her milking days are over, make a good grazer.

In conclusion, I would urge breeders to be most careful in selecting docile, contented animals, and after they have secured them insist on their servants treating the animals with every kindness. The cow, especially when in full milk, is most sensitive, and it is extraordinary how she immediately decreases her milk supply if she has anything to irritate her. Nothing is gained by having second-class milkers at a low wage. I prefer men amongst cows to boys; they are more regular in their time, and more careful in seeing that no milk is wasted. In these days careful attention to detail means, with good fortune, a certain amount of profit, whereas carelessness and inattention to detail inevitably means loss.

Mr. Hobbs, said he had often reared six calves to a cow, with the help of calf meal. As to calf meal, the items he used were generally these: 3 parts linseed cake, 2 of linseed meal, 1 of malt, 3 of peas or beans, 1 of wheat and 1 of maize. This home made meal had been used on his farm for fifteen years. As to the temperature of a cowshed, he thought 60 degrees the best. With respect to milk fever, a remedy which may appear foolish carried out in his district was to refrain from milking a cow for twenty-four hours after calving. He had also tried a milk-fever drench, which he thought reduced the stamina of the cow too much.

**FEEDING CALVES.**

**Embryces—Beistyn—Suckling—Skim-milk, &c.—Weaning, &c.**

A wonderful provider is Nature! Few of our readers have probably seen a

(1) Mr. Hobbs knows what he is talking about.—Ed.

salmon just hatched: those who have will recollect that, attached to its belly, the tiny fish carries a finer sac, or pouch, filled with sufficient food to last the new denizen of the water for several days. And this is not the only duty performed by the food-reservoir: it serves as an anchor to prevent the rapid stream from sweeping away the little orphan into the sea, before the tender frame is fitted for the impending struggle with the dangerous embraces of its future nurse.

So, too, the embryo chicken feeds on the associated contents of its envelope; the imprisoned butterfly finds store of nourishment in its nymph state; and the very "oyster spate" is not left unprovided. But, wonderful as all this watchful provision of the great Mother doubtless is, to our mind, the arrangement of the first food of newly born mammals is more wonderful still. If you examine the intestines of a still-born calf, you will find them filled with a peculiar glutinous substance, blackish green in colour, and of a pasty consistency. This, called in scientific language, "meconium," has been accumulating during the foetal existence of the animal, and must be speedily got rid of on the birth of a living calf. A means of doing this, without danger to the new born, has been provided: any ordinary observer must remark the extremely rich appearance of the first milk drawn from the cow, and other farm mothers, after parturition. This "colostrum," or "beistyn," as it is called in Scotland (we have no name for it in our part of England), is a mild aperient, and differs, materially, from the composition of the subsequent milk: as will be seen by the following tables:

COMPOSITION OF COLOSTRUM.

	Water.	Albuminoids	Fat	Sugar.	Ash	Alb. Ratio.
Ewe .....	73.5	15.4	2.0	8.1	1.4	1.0.8
Sow .....	70.0	15.6	9.5	3.4	0.5	1:1.7
Cow .....	71.5	20.7	3.4	2.1	1.8	1.0.5

COMPOSITION OF MILK.

	Water.	Albuminoids	Fat	Sugar.	Ash	Alb. Ratio.
Ewe... ..	83.3	5.5	5.5	5.6	0.9	1:3.3
Sow .....	81.6	6.5	5.8	3.4	0.9	1:2.3
Cow .....	87.0	4.0	3.7	4.4	0.7	1:3.3

You will see at a glance that the beistyn contains an enormous percentage of albuminoids; to what it owes its efficacy as a mild aperient we confess we do not see, but an aperient it certainly is, and we presume no farmers throw it away, as used to be done in former days if they do, they run the risk of losing their calves from constipation. The ash of 100 lbs of cow's milk will supply about 20 lbs of phosphoric acid; .10 lbs of lime; and .17 lbs of potash; all necessary to build up the tissues and bones of the young animal.

But, it will be said, although I want to rear good calves, I really cannot afford to give them new milk. Butter and cheese are high in price, and meat is cheap. are there no means of rearing young stock with skim-milk assisted by other foods? To answer this question I must enter fully into the treatment of the calf from its birth, promising that no means known at present will make such good calves as the natural milk of the dam, and many calves reared at the pail are lost from greediness in feeding.

The calf is just born. If you want the cow to be troublesome, bearing

after her young one, let her see it, fondle it, and lick it all over. If, on the contrary, you want her to be tranquil, and after darning her mash, to lie down to rest and recover herself, take the calf away at once, holding it by both fore and hind-legs, place it in a warm corner, cover it up with plenty of the softest straw (barley-straw for choice), and leave it alone. don't attempt to dry it by rubbing, as that always tends to gum the hair together—the moisture will soon evaporate. There is no hurry to feed the calf, but the cow should be milked as soon as possible, and then left quiet, the milk being kept at its original temperature until the calf has taken it: this is most important, as the slightest internal chill will often kill the tender creature.

If the calf has, as we advise, never been allowed to suck its mother, there will be no difficulty in teaching it to drink. Never mind whether the young one is standing or lying. disturb it as little as possible: take some of the best yeast—temperature not below 90° F.—in a small pail, and supporting the calf's lower jaw with the palm of the left hand, the arm round the neck, open the mouth with the thumb of the same hand. Fill, then, the hollow of the right hand with the yeast, pour it into the mouth and let one or two fingers remain in the mouth for the calf to suck. Let it take as much as it pleases, and then, after wiping the jaws &c. clean, leave it to repose. After the first two or three feeds, that is, when the animal drinks freely, don't allow it to suck the fingers any more, or else it will refuse to drink without them, which you will find a bore.

A calf should never be fed fewer than three times a day—it will take from 3 pints to 3 quarts a meal or from 4½ quarts to 9 quarts a day, and the milk for the first fortnight at least, should be, we had almost said must be, fresh from the cow.

But you want to make butter as well as to rear calves. Well, if you must, there is only one way, and with care it does not succeed badly. Remember that you have got four things to study in preparing a substitute for the mother's milk: fat, muscle, and bone, and the digestibility of the whole must be as perfect as possible, and thoroughly balanced in the proportions.

The skim-milk, which will be the foundation of our food, is rich enough in phosphate of lime to supply all that is wanted for making bone. Many years ago, we proved this experimentally by giving a half-bred shorthorn calf as much skim-milk as he would take for the first 6 months of his life. A monstrous beast he grew, and at 18 months, we sent him to Smithfield market, where he sold, as we expected, sausage-meat price: the lowest in the market. He was all bone, and his hocks and knees were a sight to be seen!

But with the following mixture, we have succeeded in making calves, which at 13 weeks old fetched £5 (\$26) a piece in the same market. 2 oz. of linseed-meal and 4 oz. of pease-meal, carefully mixed with 'boiling' water into a thick pudding and stirred up in the usual quantity of skim-milk—this is enough for a calf for one day, and should be given at 96° F. Here we have bone-earth in the skim-milk; fat in the linseed; nitrogen in the pease; carbohydrates in all of them; and the slightly aperient power of the linseed will keep the digestion all right. A food, this, we think we are justified in saying, as near perfection as possible.

You will observe that we state a quan-

tity—6 oz.—but you should not give as much at starting. Bring the calf to it gradually, beginning with 2 oz. a day, and in ten days time it will take the whole without inconvenience. Beware of "ground" oats; the husks produce what, I believe, doctors call a "peristaltic" action of the bowels, and frequently cause death.

Mr Ville, a not always trustworthy authority I regret to say, gives the following three experiments in calf-feeding to show the preponderant action of albuminoid and fatty matter, for every 100 lbs of live-weight the three calves received.

	Case.	Fatty matter.	Sugar of milk.	Increase
	lbs.	lbs.	lbs.	lbs.
1. Skim-milk .....	4.6	1.4	5.5	13
2. Skim-milk and whey .....	4.6	2.0	7.7	26½
3. Milk fresh from the cow .....	5.1	7.5	6.3	48½

The second calf received more carbohydrates than the first, and the third received an excess of fatty matter and albuminoids. All three drank the same quantity of milk: the deductions may be left to your judgment.

By the bye, don't try to give whole linseed, boiled, under any circumstances. From thoroughly well authenticated trials, it is certain that 800 grains out of every 1000 grains of linseed given uncracked, pass through the animal untouched by the digestive powers, and are absolutely wasted. Boiling for 24 hours will do no good. Take a grain in your mouth; hold it there for a few seconds; and then try to crack it with your teeth. You will need no further experiment to convince you of the necessity of crushing all the linseed you use.

Calves fattening for veal may be tied up, and kept in a dark place. Those intended for rearing should be kept in the light, and have room enough for play. It is a question with us whether a muzzle should be used to prevent the little ones from sucking each other's ears, scrotum, &c. It is not a healthy habit—as bad almost as crib biting or wind-sucking in a horse—but I am such an advocate for liberty for young stock, that I cannot bear the idea of confining them even at the earliest stage; and a muzzle—as light a one as possible—seems the only preventive; and even that cannot be long employed, as at 3 weeks old the calf should begin to nibble at his future food, and we will now consider what this is to be.

Don't begin to wean before the thirteenth week from birth, and then do it as gradually as possible. By this time the calf will have become accustomed to eat—if you have the good sense to offer them to it—the finest clovery bits of hay; crushed linseed; pease meal, malt-cummins; some cut swedes (I don't recommend mangolds till late in spring); carrots, anything in fact, and the more varied the food the better. It was a wise saying of the late Mr. McComble: "Never let the animal lose his calf's flesh;" and we hope all our readers will remember it, and profit by it. It should be written in large letters over every farmer's chimney-piece. Don't be in a hurry to get your calves to grass; rather indulge them with a fortnight longer on the milk; and for the first month or so, let them come

into the sheds from the pasture at night. We would not turn young ones out till the 10th of June, in this province, but the season and the locality must be your guide. And we should be unwilling to dock the linseed (¼ of a pound a day) at first. It is a wonderful, though simple, corrective, and saves more lives than we wot of. The best pasture for calves is the first year's grass, and a part of it should be divided into two, or preferably, into three enclosures for them, so that they may have it fresh and fresh throughout the season. It is a lamentable thing to mark the numberless instances in which the poor things are sent out to a bare burnt up pasture, to pick up a living as they can. How can anything be expected from such treatment but a wretched lot of pot-bellied, hard-skinned, raw-boned brutes, whose very look tells you that it would never pay to fatten them?

The treatment of calves suckled by their dams is simple enough. They may be kept in loose boxes, or tied up, and should be let suck at least three times a day, preferably, four times. The greatest care should be taken to milk the cow dry twice a day if she has more than will satisfy the young one. Neglect of this is the chief reason why so many Herefords, Augustes, and Galloways are such bad milkers. Running loose with their calves, the production of milk is gradually restricted to the amount required by the suckling, and as this is rendered customary by family descent, the habit becomes engrained in the breed.

"A Yorkshireman" says: A good fair shorthorn cow, any number of which may be purchased at York market, will, within the twelve months, suckle from five to six calves, and the two year old heifers, two calves. The system is this: To put two calves to a cow at the same time, until about ten weeks old, when they are weaned at once, then two more for the same time, and then one, unless the cow is an extraordinary milkier, when a sixth is added. The heifers calve at 24 months, old, when each suckles her own offspring, and then another, when the dams are fatted and killed at three years old, making from £20 to £22 each. In the winter the cow is tied up, and the two calves tied also, one on each side of her, and allowed to suck three times a day. The early calving of the heifers does not appear materially to reduce their size, those kept on as cows making when moderately fat, from £25 to £30.

THE USE OF BASIC SLAG.

Origin—Fine grinding—Soils for—Time of spreading.

Basic slag or Thomas's Phosphate Powder is a substance the use of which as a fertiliser has developed to a wonderful extent in the comparatively short period since its introduction into commerce. Primarily, as most people are aware, it is a residual bye-product obtained in the smelting of steel from pig iron, the phosphorus of the latter being extracted from it by lining the Bessemer converters with magnesia and lime. Under the extremely high temperature the phosphate is yielded as a tetrabasic compound, the phosphoric acid of which is much more readily accessible to plant life than in the case of the ordinary tribasic phosphate. The manurial value of the fertiliser is proportionate to the fineness

to which it has been ground; so that a guarantee should be given not only of the total percentage of available phosphates, but also of the proportion of the whole that will pass through a standard sieve of 10,000 meshes to the square inch. These guarantees vary from about 12 to 43 per cent. of tribasic phosphate of lime and from 70 to 90 of fine meal, as the percentage of fineness of grinding is technically called. From these figures it will be seen that various makes of basic slag vary much in value, though the different grades are unfortunately indistinguishable from one another by their appearance. Agriculturists should therefore be on their guard when purchasing phosphate powder; and they are strongly advised to deal only with houses of the best repute, if it is not intended to submit samples of the manure to analysis, as instances have not been wanting in which ordinary iron slag, which is of course valueless from a manurial point of view, have been supplied under the name of the genuine article. Passing next to the consideration of the soils on which this fertiliser answers best, we find it is especially adopted for use on all lands deficient in lime. Under which category fall many granite, clay heavy and sour lands, a great number of those rich in organic matters, and most old pastures, even though actually overlying calcareous strata. Though an invaluable fertiliser for all root and most forage crops, it is more especially as a manure for pasture land that we wish to discuss basic slag here, the rather since the autumn is the most suitable time to apply it to the soil. The large proportion of lime and phosphates present have a wonderful effect on clovers and similar leguminous plants, stimulating their growth to a surprising degree; and it is in this fact that the value of the manure for pastures lies. We have seen old meadows, which were unremunerative previously, become covered after application with white and crimson clovers, excellent alike for hay or grazing purposes. Indeed, such capital effects are to be seen that we very strongly advise farmers to try the plan of sowing a strip of the fertiliser up the middle of a field by way of test. Phosphate powder, like bones, is essentially a landlord's manure, since it continues to benefit the land for a number of years, and is never washed away by heavy rains. Like all artificials which exert a continuous effect over a period of years, it is a little slow in showing the beneficial results of its action; and it is for this reason that we advocate its use during autumn and winter, so that sufficient time will have elapsed for its effects upon the crop to be seen by the summer following. About five or six cwt., should be drilled or broadcasted per acre. There is only one point requiring care in the actual application of the manure, and this is that it must not be allowed to come into contact with ammonia sales until the lime has been converted into carbonates by the action of the weather and influence of the soil, or loss of ammonia will inevitably follow. For practical purposes this resolves itself into the fact that though nitrate of soda may be safely used, sulphate of ammonia and other fertilisers containing ammonia salts must not be applied to land for about six months after basic slag has been used. After about a dozen years' experience we have come to the conclusion that it is the cheapest and landiest form of phosphate known at present.



## Household-Matters.

### Outside show—The farmer's wife—Injudicious marriage—Advice to mothers—Recipes—Hints for the toilet.

The tendency of the present time is to work for outside show, forgetting entirely that the worker is not always up to the mark for doing so. A fragile woman, whose means are small, will work hard to keep up to the standard of her stronger, or richer neighbour.

This is all very well as long as her health lasts, but when that breaks down, the poor fragile one succumbs, and is often nothing but a broken down ailing woman for the rest of her life. Too late does she realise how foolish she has been in not husbanding her strength for the contest with the realities of life, which comes to every one sooner or later.

Weak nerves were hardly known in our mothers' and grandmothers' time, and in this one respect woman, so far as she is physically concerned, is not progressing.

The modern tendency towards the craze for outside show seems to have crept into every class of life. Far back in the country the young farmer often, rather than not, seeks for a pretty face in a wife rather than a working partner.

One out of a few cases that came under my notice this summer:

A farmer, with a hard working wife, whose combined efforts have managed to own a farm just clear of debt, with some day to give it to their son, but find the young man madly bent on marrying a pretty-faced consumptive girl, who of course is utterly unfit and quite unable to help in the daily duties of a farmer's wife.

**CHAT FOR THE WOMEN.**—The woman who will endear herself to June brides is she who is now making a collection of swell boxes in which to pack her unostentatious gifts.

The woman who wishes to be an attractive object this summer should remember that coolness and repose are incompatible with athletics, and should decide early which rôle she will choose.

The woman who fails to achieve popularity can always solace herself with the reflection that popularity is a cheap attainment at the best, and that the crowd is always caught by gilding rather than by refined gold.

The woman who would fain be considered sweet and lovely will find the easiest way to attain that result is to think other people sweet and lovely. The mind which seems incapable of suspecting others of guile is always considered particularly innocent itself.

**FOR MOTHERS.**—Teething babies, are frequently thirsty, to relieve which give a little water in a teaspoon several times a day, rather than allow them to drink immoderately from a full glass of water. The pain is sometimes relieved by giving the infant very small pieces of ice—that is, about the size of a pea, and without any sharp points. Hold the child's head up to allow the ice to melt before swallowing.

**BABIES SHOULD NOT BE** allowed to walk, and very seldom to stand, while they are under a year old, and even from one year to eighteen months it is far wiser not to let them walk much. Have patience, and refrain from en-

couraging the tiny one to walk too soon. Crawling is safe; then, all in good time, they will walk easily and well.

**FOR A RESTLESS CHILD** dissolve a cup of hot salt in the (tepid) night bath. It will act better than a sleeping draught.

**INFANTS DO NOT HEAR** at all until they are three or four days old, and they do not feel either pleasure or pain keenly until quite two months; therefore, in the case of deformities, it is better to have any necessary operation performed during the early months of the baby's life.

**COOKING—SOUP.**—As a substantial and toothsome dish of haricot mutton would follow, a plain soup was considered sufficient; had the rest of the meal been of a less satisfying nature, the soup, instead of being made of milk and water, would have had the same quantity of stock for a foundation.

**"Ingredients."**—1 lb. peeled potatoes, one large onion, 1 oz. butter, three pints water, one pint milk, spoonful fine sago, pepper and salt to taste.

**"Mode."**—Melt and make hot the butter in the pan, and meanwhile scald the onion in boiling salted water, which makes it more digestible; cut the potatoes in slices, and stir them with the cut-up onion amongst the hot butter for five minutes. This is called sweating the vegetables, and improves and brings out the flavour. Add the water, and, when boiling, remove scum; boil for two hours, rub all through the sieve, return to the pan with milk, sago, pepper, and salt; stir till it boils, and continue boiling till the sago is clear, which may be in about ten minutes; serve with or without diced toast.

**HARICOT MUTTON.**—1 lb. chop, cut from the lean part of the neck, one carrot, a piece of turnip (not too large, as the sweetness of the turnip would spoil the flavour), one onion, 1 oz. dripping, a large cup of warm water, dessert spoonful of flour, tablespoonful ketchup, pepper and salt to taste. Put the dripping into a iron pan, make it smoking hot, cut the meat into neat pieces, and brown it in the dripping as quickly as possible, when done on both sides, fit it out, cut the onion into slices, and brown it in the same way, return meat to pan, add the warm water, pepper and salt. As soon as it boils, remove scum, slice the thick end of the carrot, grate the thin end, cut the turnip into neat pieces, and add all to the meat; but be sure the water is boiling before the vegetables are added, or they lose their colour. Let the whole come to the boil, draw pan to the side and simmer one and a-half or two hours, arrange on a hot dish, with meat in the centre, and vegetables laid neatly round; put in the oven or before the fire to keep hot, and thicken gravy with the flour, which must be made smooth with a little water and the ketchup, pepper, and salt; boil two minutes to thoroughly cook the flour; pour through a sieve over the meat and serve hot.

**SOME COOKERY ITEMS.**—"Some dainty for an invalid" is a thing we are often at loss to devise when there is sickness in the house. For once, try a roasted pigeon. Of course, it must be a young one. (1) Stuff it with a little

(1) A pigeon that can fly is too old for the table.—Ed.

be a young one. Stuff it with a little bread and butter, seasoned with pepper and salt. Truss and place it in a small oven before a clear fire, basting well with a little butter. Turn frequently from side to side, and cook from twenty to thirty minutes. It can be served with bread sauce and a few browned crumbs.

Now for a nice little pudding to follow the bird. Place a couple of rusks into a small pie dish. Make half a pint of nice custard and pour whilst hot over the rusks; beat up with a fork, and flavour to taste. On the top place a few bits of butter, and bake till of a nice brown colour. Serve with sifted sugar or stewed prunes.

Here is a good way to clarify dripping. Place the dripping in an old iron saucepan and cover it with boiling water let it boil with the lid off for twenty minutes. After it has cooled a little pour it into a jar or large basin, and let it remain till quite firm. You will then be able to scrape all impurities from the bottom of the cake of fat. Fat which has been clarified in this way can be used for pastry and cakes, and is excellent for frying.—"English paper."

AUNT ANNE.

**CORN CANNING FOR FAMILY USE.**—To can corn split the kernel lengthwise with a knife, then scrape with the back of the knife, thus leaving the hulls upon the cob. Fill cans full of cut corn, pressing it in very hard. To press the corn in the can, use the small end of a potato masher, as this will enter the can easily. It will take from 10 to 12 large ears of corn to fill a quart can. When the cans are full, screw cover on with thumb and first finger—this will be tight enough—then place a cloth in the bottom of a wash boiler to prevent breakage. On this put a layer of cans in any position you prefer, over the cans put a layer of cloth, then a layer of cans. Fill the boiler in this manner, then cover the cans well with cold water, place the boiler on the fire, and boil three hours without ceasing. On steady boiling depends much of the success. After boiling three hours, lift the boiler from the fire, let the water cool, then take the cans from the boiler and tighten again. Wrap each can in brown paper to exclude the light, and keep in a cool dry cellar, and be very sure the rubber rings are not hardened by use. The rings should be renewed every two years. I would advise the beginner to use new rings entirely, for poor rings cause the loss of canned fruit and vegetables in many cases. You will observe that in canning corn the cans are not wrapped in cloth nor heated; merely filled with the cut corn. The corn in the cans will shrink considerably in boiling, but on no account open them after canning.—(C. E. Hubbard, Mass.)

**WASHING WITH PARAFFIN.**—I should not recommend this form of washing as a general rule myself, because it is not always possible to adopt the means to ensure the process being a perfect success. First and foremost is drying out of doors, which in a town is not always practicable. Then, a good lot of hot water is necessary for rinsing; this again is not always procurable in a small house. If, however, these conditions are obtainable it cannot be denied that remarkable results can be arrived at with paraffin in the washing

of the very dirtiest clothing with little or no labour. Fill your boiler three-parts full of cold water, into which spread half-a-pound of soap. When the water has boiled add two or three tablespoonfuls of paraffin. Now put your clothes, which must be quite dry, into the boiler, pressing them down with the stick. It is necessary that the water should boil quickly for half an hour. If it ceases boiling, a dirty scum will settle on the clothes. Half fill a tub with hot water, lift the clothes out of the boiler with a stick and drop into the hot water, wash out, and rinse in several waters, blueing the last. But I warn you that unless the clothes are well rinsed of every particle of soap this method of washing will not be a success. Drying in the open air is essential to remove any unpleasant smell of paraffin.

**HINTS FOR THE TOILET—RAIN-WATER** has no equal for the complexion. It contains traces of ammonia, and is therefore particularly cleansing and invigorating to the skin.

**NEVER THROW AWAY** lemon, orange, or cucumber peel, which are all excellent for the complexion. Let them soak in your water-jug; they not only soften the water, but act as a splendid tonic, freshening up the complexion, and keeping the flesh healthy, firm, and clear.

**TO MAKE BRAN** or oatmeal water; tie up four or five ounces in a muslin bag, and pour thereon three pints of boiling water; use when cool or cold. For bathing the face, neck, and hands, there is nothing more softening, cooling, and cleansing.

**FRICTION** has a most beneficial effect upon the skin, and is probably the most healthful, effective, and ready substitute for the entire bath that can be employed.

**NO ONE SHOULD FEAR** using perfumes, the stimulating and refreshing properties of which cannot be over-estimated: they are health and beauty-giving, especially sweet lavender, lemon, roses, scented geraniums, violets, sage, and benzoin.

HOUSE-KEEPER.

## CULTIVATION OF MANGELS.

### PREPARATION OF THE SOIL.

In the cultivation of mangels the first thing to be looked to, is the right kind of soil, a deep black loam with not too stiff a subsoil will perhaps suit them as well as any. And the proper time to commence the cultivation of it will be the year before you intend to sow them. We generally select a piece of ten sods (1) and just before harvesting commences we put about 20 cart loads of well rotted manure on it, turn down the sod with the plow to a depth not exceeding 4 inches, give it a few turns of the drag harrow which will induce any weeds to start and also hastens the rotting of the sod. In about 6 or 7 weeks after, we apply another coat of manure, about 15 loads to the arpent, plow crossways 6 inches deep, clean

(1) All roots should follow the last crop of the rotation, i. e., the stubble of a grain-crop.—Ed.

out the water-furrows well and leave until the following spring. The first thing we do then, after the soil is perfectly dry, as deep as you have worked it, is to start the cultivators and harrows and work to a fine tilth, plow again going no deeper than the previous plowing, (1) harrow it well and roll it, then form your drills 26 inches wide, the soil being finely worked, and the manure well mixed with it, is now ready for the seed.

**PREPARATION OF THE SEED FOR SOWING**

Before sowing the seed which should not be much later than the 15th of May, place in a linen bag and soak in water for at least 12 hours. This will cause it to germinate much quicker and more surely. Sow with the seed drill at the rate of 4 pounds to the acre  $\frac{3}{4}$  of an inch deep.

**CULTIVATING AND HOEING THE PLANTS**

In about 20 days the plants should be easily noticed in the drills; pass the wheel hoe through them which will check the grass and weeds at the start. In about 10 days after, pass the cultivator, then the hand hoes, immediately after single them out, the long teds to 10 inches, the globe varieties to 12 inches. Another hoeing will be all they require, but the cultivator should be kept going, especially in dry weather, simply stirring the top of the soil to allow the moisture in the air to reach the roots of the plants.

**HARVESTING THE ROOTS**

After the first week in October it will be well to get them out of the ground, as frost may injure them; to top them a sharp sickle or a long knife (2) will do the job quickly, after which the roots can be easily taken out. Place them in piles using the tops for a covering, allow them to lie for a week until they take a sweat, after which they can be stored for winter feeding. They should average at least from 25 to 30 tons to the arpent.

**A FEW USEFUL HINTS TO ROOT GROWERS**

Don't think of working the soil when it is not perfectly dry, as it always means harm.

Don't allow the weeds to get the least headway, as it will cost double the work after.

Don't think of working a large piece of roots without the latest improved tools.

(NO NAME ATTACHED.)

**Swine**

**MILKING QUALITIES OF BROOD SOWS.**

**Good sucklers—Modern cows bad milkers—Fat vs fecundity.**

The value of a brood sow depends to as great an extent, or even greater, than any other one thing upon her milking qualities. The sow that is a poor suckler is never profitable as a breeding sow. She has unusually small litters, and these fail to thrive, for the simple reason that they are not fed. On the other hand, a sow that is a good milk—er, as we say, a good suckler—has usually large litters, takes care of them so well that they make rapid advance-

(1) No one can keep the plough steady in the moved soil. The second furrow should be an inch deeper than the first ploughing.—Ed.

(2) Never cut beets of any sort as they would bleed to death.—Ed.

ment, and soon outstrip the rest of the herd. They grow from start to finish, and prices must be low and feed high if they do not pay a profit. A brood sow that is a good suckler is worth two that are poor, and even more. Whether the pig department of the farm in any year gives a profit or a loss depends largely upon the milking qualities of the brood sows, says a writer in the "Farmer and Stockbreeder."

Singular as it may seem, this point has been largely overlooked by farmers, and even by breeders of improved pigs. The present ideals of beauty in any kind of live stock are against the development of milking qualities, and the effects are seen not merely in pigs, but in cattle and sheep as well. In fact, on many breeders' farms the working herd of any kind of stock is of different type from the show herd. The one is selected with an idea of beauty of form and color, something to catch the eye of the granger: the other with the idea of utility and money-making. The farmer who buys brood sows at a show is not very likely to secure good milkers. Where fat covers a multitude of sins, as it always does, one of the most frequent, will be barrenness, or at least shy breeding and poor milking.

The best way to secure a milking herd of brood sows is to select pigs of sows that are good milkers. Select, at least, from the best milkers in the herd, and condemn the rest, no matter how handsome they may be, or how nearly they come up to the fashionable ideal, to the feed lot to be fitted for the shambles. By continuing this process from year to year, a very fair herd of sows will be secured.

It is not enough however, to select well. Feeding is as important as selection. No matter how good the stock may be, if the young things are fed all the corn they want to eat from birth until farrowing time, they will be poor milkers. It is impossible to develop a roomy sow with milking capacity without feeding largely on albuminous foods. The proper frame, bone, and form can be developed on clover pasture, on foods in which oats, bran, and shorts are predominant, with plenty of exercise for muscular development, and they can be obtained in their highest form in no other way. The short, compact brood sow, pretty as a picture, is not the one to yield a profit in the breeding herd. Plenty of corn will develop her beauty, because it will develop fat; but fat and a high degree of fruitfulness or fecundity are incompatible.

Nature is wise enough not to spend time in developing milking capacity beyond the wants of the litter. It will thus be seen that the sow that is a good milk must be built up from the foundation. Select, first, an inheritance in that direction, with vigorous and abounding health, and then feed along the line of nature as indicated.

Many dairy cows of strong milking inheritance, and that have been properly fed up to the milking period, are spoiled by bungling milkers. There is no danger of spoiling a brood sow. The pig, before he is an hour old, has mastered the science of milking, and has acquired greater proficiency than the most skilful dairyman in the country. That organized appetite which we call the young pig is thorough master of all the instructions ever given on the subject of milking. He milks quickly, thoroughly, and gently, except when his rights are disputed.

By thus selecting with an eye to inheritance of milking qualities, by feeding from birth, or rather from conception, with the object of securing vigorous and abounding health, and along the lines nature has indicated, the herdsman will be working with nature to victory, instead of against her to inevitable defeat.

"Farming."

**THE LAW OF INDIVIDUALITY.**

In the very thoughtful article from Webb Donnell on "Prepotency in Breeding," printed last week on page 603 the writer used these words: "It would tax the powers of a Darwin to tell us why it is that of two cows fed side by side upon exactly the same food, one will return twice the amount of milk and cream that the other will."

This law of individuality is one of the hardest to understand. Yet it is found everywhere about the farmer's footsteps. Go into the cornfield and ask why one stalk of corn will grow strong and rampant and another show a weakly growth in the same soil? Why one stalk will show a fine heavy ear and another will be barren? Go into the pig pen and ask why in a litter of pigs from the same mother, one will be a "titman" and another make three times the growth?

This law of individuality obtains everywhere in nature. We once planted every kernel of corn in a single ear, in one straight row, stalks 10 inches apart. We started at one end of the row with the kernels at the butt of the ear, and finished at the other with the kernels at the tip ends of the ear, so that the full row represented longitudinally the ear of corn. We found this law of variation showing itself at every portion of the ear, there were weak plants from the kernels at the butt and strong ones at the tip. The strong ones at the tip. The strong kernels simply inherited more vitality or what we call constitution, than the others.

The work of the breeder includes that of selection. It is his business not only to breed well and carefully from favorable blood lines but he must also be able to follow out the law of selection.

What we have said will furnish a hint in the selection of seed corn as well as breeding animals. When seed corn is selected it should be from stalks which show a strong vitality, with a full vigorous growth. It often occurs that a weakly stalk will ripen a good ear just as weak parents may have strong children. But the after history of both seed corn and children will be likely to show the effect of their weakly parentage.

The whole business of the farmer (and the farmer ought to be the best posted of breeders) is to study out the laws of Nature. Breeding to his "purpose" whether it be for milk and butter or beef in cattle, or wool or mutton in sheep, or speed or draft in horses. He must first study out the law that governs his particular purpose and then be absolutely obedient to it. It is "law", "Law," LAW everywhere and it takes a strong, well-trained intellect to make much headway with the secret workings of Nature's laws. "Hoard."

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White.....	27 20
Red.....	26 27
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Barley (grinding).....	14 22
Oats, English per 8 bushels.....	15 20
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Wheat—Manitoba.....	28 28
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Scotch per stone of 8 lbs.....	4 6
Herefords do do.....	4 4
Welsh (runts) do do.....	4 2
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Small Downes per stone of 8 lbs..	5 6
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Fresh, (Finest factory) per doz.	
lbs.....	11 1'
English Dairy-butter fresh.....	10 1
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Danish.....	9 6

**BACON.**

Irish.....	58 01
Canadian.....	35 44
American.....	48 50
Irish hams (small).....	88 94
Hay, per load of 2016 lbs.....	
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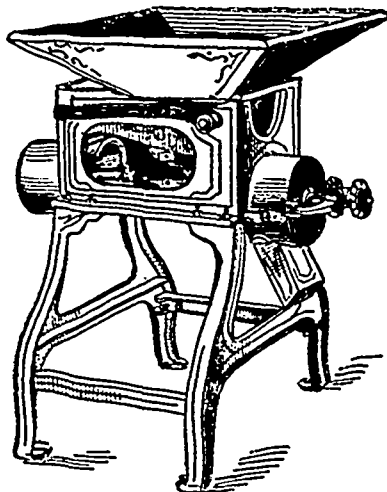
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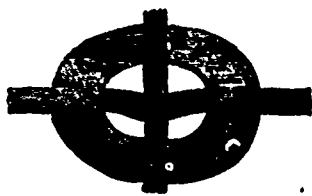


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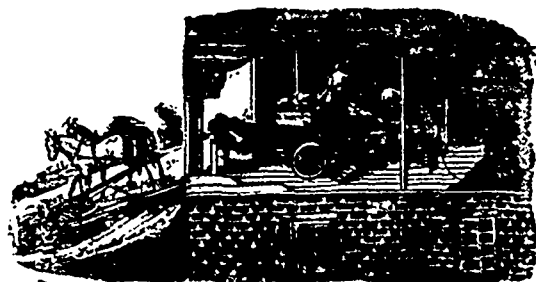
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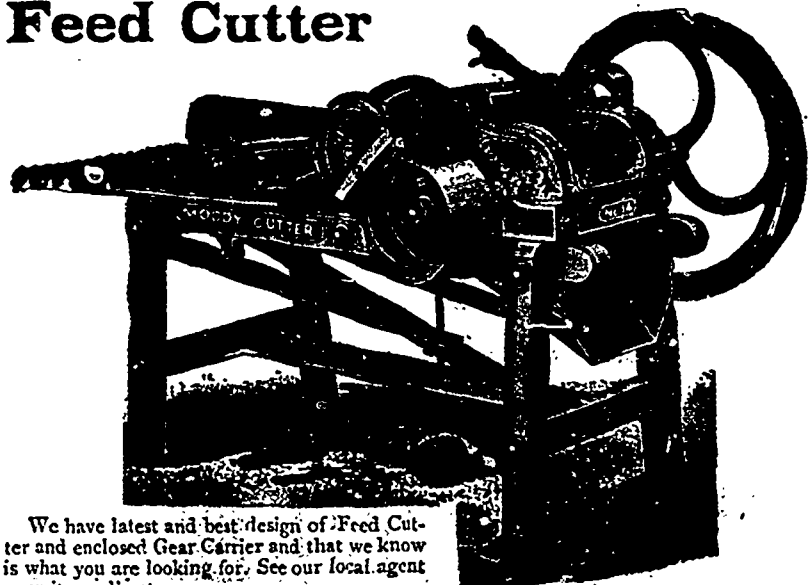
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