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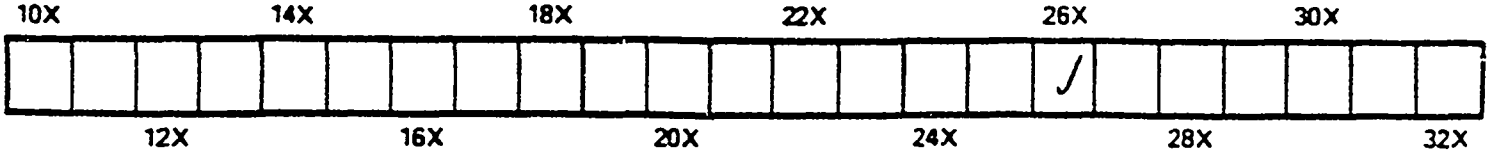

THE JOURNAL of AGRICULTURE. ILLUSTRATED

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Weeds and Artificial Manures.

BY SIR J. B. LAWES, BART, LL. D., F. R. S.

EDS. COUNTRY GENTLEMAN—Many years ago I received an angry letter from a gentleman to whom I had sent some artificial manures. He said that it had filled his land with weeds. If, instead of manure I had supplied him with seed wheat, he might have complained with equal truth that I had filled the field where he had sown the seed with rooks and pigeons. It was absolutely impossible that the manure could have contained any seed, but there were the weeds, which, previously small and insignificant, had now become giants, and were successfully contending with the crops for a share of the luxuriant repast which had been provided for them. I have written several articles on weeds lately, in *some of the English papers, and I now propose to make a* few remarks on the same subject on the other side of the Atlantic. I wish to show that a cleaner state of farming must be followed where the use of artificial manures prevails. In ordinary farming the weeds and the crop draw their nourishment from one common stock. Of the great mass of fertility which exists in the soil in an insoluble form, a certain amount becomes active each year, part is taken by the crop and assumes a high value; part is taken by the weeds and is of no value, they are therefore ploughed under, and become part of the insoluble stock of fertility again. Very likely it does not pay to clear the land, labor may be scarce and dear, and it is better that the weeds and the crop shall grow together.

Let us now assume that in order to grow bigger crops artificial manures are applied. The ingredients in artificial manures are, or should be, active, and being active, they are dear. The soils to which we apply these active manures contain a vast quantity of the same ingredients, but in an inactive form. For example, I have just grown the thirty-second crop of barley, manured each year with superphosphate of lime and nitrate of soda; the yield was 53 bushels per acre. The superphosphate alone, in the same field, gave 22 bushels per acre, so the nitrate added to the crop 31 bushels. The manure contained about 40 pounds of active nitrogen, the soil contains several thousand pounds of inactive nitrogen, of this a sufficient amount became active to grow the 22 bushels with the aid of superphosphate.

A bushel of barley contains about one pound of nitrogen, and is worth $1. The pound of nitrogen in the nitrate costs about 12 cents. It is evidently to my interest to turn as much nitrate into barley as possible. Let us suppose that instead of producing 31 bushels by means of the nitrate I had only produced 21 bushels, and the weeds had taken the rest of the nitrate. In both cases, active nitrogen is converted into inactive nitrogen, in the grain it has a market value, in the weeds it has none. The nitrate which grew the weeds is not lost, it will in time become nitrate again, but it has evidently been wastefully employed, and the land might have been manured at a cheaper rate by swamp muck. It will be seen, *therefore, that weeds grown by the fertility existing* in the soil are far less injurious to the pocket of the cultivator than those grown by purchased fertility. If I have made this clear, the United States farmers are far too acute not to apply it to their own cases, and thus will either abandon the use of artificial manures, or see the necessity of using them in connection with a more cleanly mode of cultivation.

First Steps in Farming—Young Man's Department.

FEEDING MILCH-COWS—CONTINUED.

HAY.—I don't like hay for cattle. What I mean to say is, that as a food it is costly compared with other kinds of stuffs. Still, it is a convenient thing, and we can't all grow straw enough to supply our beasts. Horses must have hay. and I suppose we shall have to go on making it every summer, though I confess I grudge the time devoted to it, which, in my opinion, had much better be given to hoeing corn, mangels, and turnips, on light land, and fallow-making on heavy. I shall not stop to prove that clover-hay, cut when just in full bloom, and well made, that is, with all the leaves on the stem (not on the ground), is the best of all hay. The following simple statement is proof enough.

CLOVER-HAY.	IN 100 LBS.	DIGESTIBLE	IN 2000 LBS.
Albuminoids	15.3	10.7	214 lbs.
Carbhydrates	35.8	37.6	752 "
Crude Fibre	22.2		
Fat	3.2	2.1	42 "
			1008 "
AVERAGE MEADOW HAY.			
Albuminoids	9.7	5.4	108 "
Carbhydrates	41.6	41.0	820 "
Crude fibre	21.9		
Fat	2.5	1.0	20 "
			948 "

I need hardly say that the large quantity of digestible albuminoids contained in the clover very much exceeds in value the 3½ pounds extra of digestible carbhydrates in the meadow hay. Indeed, if you will look thoroughly at the point, you will see that meadow hay is moderate stuff; in fact, compared with really well made clover, it is quite inferior, in spite of the mixture of different grasses in it. A food quite equal to meadow-hay may be made with a mixture of one ton of clover and one ton of good oat-straw:

OAT STRAW.	DIGESTIBLE.	IN 2000 LBS.
Albuminoids	1 4	28 lbs
Carbhydrates	40 1	802 "
Crude fibre		
Fat	.7	14 "
		844 "

Now, adding these constituents to the albuminoids, &c., contained in a ton clover, we have:

214 + 28 = 242 lbs of albuminoids, which divided by 2 = 121
844 + 752 = 1596 lbs of carbhydrates " " " " = 798
42 + 14 = 56 lbs of fat " " " " = 28
947

which does not vary very much from the composition of meadow-hay, ...Albuminoids 108
....Carbhydrates 820
....Fat 20
948

Thus, you see that the mixture is decidedly the more profitable of the two foods. So, if you please, we will give each of our cows 5 lbs of clover-hay, and 5 lbs of good oat-straw—cut when barely ripe—a day, in addition to the ration of corn, pease, and linseed. What shall we do for the rest of the allowance? for as yet, we have only a 15 lb ration, and that won't fill the belly of a cow. We must be careful, for too much nitrogenous food is not desirable for such delicate creatures. The roots and cabbages will fill up and supply water—enough for fatting beasts, but not for cows—and any other bulky substance, straw, pea-haulm, &c., that can be got cheapest will serve.

Note, that where linseed is given bran is superfluous. I do not think bran ever pays, if bought at $16.00 a ton and over, except in the obligatory bran-mash for horses every Saturday night—they must stay at home on Sunday if they eat the mash, as it renders them liable to catch cold. (1)

Having settled the amount of food, and its quality, to be given to our cows, let us now see in what condition it is to be put before them. Cooking food for cattle rarely pays: this is an axiom. Milch-cows, however, if the price of their products is fairly high, will pay for boiling a copper-full of water once a day. My own plan has always been to pour *lots* of water over the linseed (crushed), to let it steep for half an hour, and, then, reduce the thin soup to a thick *mush* with the peas and corn and as much chaff, hulls, &c., as it will absorb; so that each cow should get about a bushel of the mixture a day. If you are feeding for milk alone, the *sloppier* the mess the better, provided always there is enough dry food given to keep the animals in good health—the dung and your judgement must be your guide in this.

But as we shall have, generally speaking, to grind our linseed up with the other grain, I fear it will be necessary to place it all together in a tub and pour the boiling water on it slowly, stirring until it is all well mixed, and then add the chaff, &c. A small linseed bruiser would be a desirable addition to the farm, and ought not to cost more than $12.00. A bushel could be done (it only wants cracking) in half an hour, and that would last 20 cows for 2½ days It is rather risky to send linseed to the mill; at least so says Mr. James Drummond.

Now, honestly speaking, does not this seem a more sensible way of feeding milch cows than giving them as much hay a day as they can eat? Consider for a moment what a complex thing milk is. It contains, as we have seen, all the elements of the body, and the food given to produce it should contain all those elements, too. Besides, where hay alone is given, do we not often see the animals pull one-third of it under their feet?

And don't be led away by charlatans who recommend you to feed only twice a day. Let nature be your guide in this. Cows at pasture make at least five meals in the twenty four hours; do you give yours at least three in the daytime, as, for instance:

Morning .... mixed ration
Noon ....straw and clover-hay
Night .... roots, cabbages, &c.

with a little straw in their racks before leaving them for the night. If the mixed ration is made in the evening, it will not have got cold by morning, if it is covered up with old cloths or sacks. Never give cold roots or cabbages to stock on an empty stomach—particularly to in-calf cows.

And having got so far, let us see what we have gained by our outlay. There is the milk at so much a quart—I can't say what that will come to, as neither quantity nor price is comeatable—and there is one thing we generally forget; viz., the dung. Mr. Horsfall, one of our great London dairymen,

(1) I repeat, for the dozenth time, that with an average of 15 horses in our stables in England we never had a veterinary surgeon called in for eleven years, reason—bran-mash once a week. A. R. J. F.

published some years ago an account of the results of 190 days feeding of six milch-cows. The food was made up as follows:

Meadow hay	56 lbs
Oil cake	30 "
Malt cummins	9 "
Bran	9 "
Bean-meal	9 "
Roots	204 "
Oat-straw	50 "
Bean-straw	12 "
	379

This gives 63 pounds a day per head, and the cost, in England, about twenty five years ago, was $311.00 or twenty seven cents a day for each cow! The six cows gave, in the 190 days, 16,000 quarts of milk, which at 4 cts a quart, amounts to $640.00, leaving the handsome balance of $329.00, or $55.00 per cow, to good, and the dung, too.

Now, samples of this dung were sent to Dr Way for analysis. According to him, the six cows produced during the 190 days, the following amounts:

	Pounds	cts	Value
Nitrogen	414	18	$ 74.52
Phosphoric acid	393	10	39 30
Potash	585	6	35.10
			$148.92

and this comes to an additional sum of $24.82 per cow, or, in all, in round numbers, $80.00 a head!

I have reckoned the prices not according to the market rates of commercial fertilizers, but from 10o/o to 16o/o below them, as I am strongly inclined to think that all scientists are inclined to overrate them. Of the quantities of the constituents there can be no doubt; but, as it is acknowledged by all that dung takes some time to benefit the crops it is applied to, and as during that time much of its soluble ingredients, by lixiviation, &c., vanish, I think we are committing a great error when we talk of dung being worth $2 50 a ton. That we must look to the manure for some part of our profit, is certain, particularly in fatting beasts, but we need not carry this too far—see "Ville on cattle manure," *passim*.

In England, the manure of a hay-fed cow was reckoned to be worth about $1 50 per ton, and as each cow generally makes about 10 tons in the winter half-year, the value would be $15.00. Of course, highly fed animals, like Mr. Horsfall's, produce manure of much better quality than these, and fatting bullocks make better still; but we must make a deduction for Canada on account of lower prices for grain, &c., and I fancy that $1.50 a ton is quite high enough for any dung in this country.

You will always take care that your cows have plenty of water, winter as well as summer. The quantity of milk yielded is more influenced by this than most people imagine. Mr. Horsfall found that cows, when giving only two gallons of milk a day, drank four gallons more water than fatting cattle of the same weight; and he inferred from this that the cows gave off from the lungs and from the skin over two gallons of water per day more than the fatting cattle of the same weight, since the water contained in the milk was only one gallon and three quarts, while the cow drank four gallons of extra water! The manure of both milch cows and fatting cattle contained about the same amount of moisture, so that can't account for the extra water.

Never overstock your pastures at any time. Economy requires the dairyman to get the greatest amount of produce from each acre of his pasture, and this can only be done by full but not over-stocking. Divide your pasture, if possible, into three lots, so that the cows may have a change at least every fortnight. Barb-wire fencing is so cheap, now-a-days, that there should be no difficulty in this, and you will find that, by this plan, you will be able to keep at least 12o/o more stock on the same number of acres, to say nothing of your whole herd doing much better. Arthur R. Jenner Fust.

Breeds of Dairy Cows—I.

Eds. Country Gentleman—Let us fairly understand this matter, for it certainly cannot be fairly understood from the numerous statements made within the two or thre past years, and continued weekly or monthy now in many of the agricultural papers. In the most prominent of them, the Country Gentleman, is a weekly flood of advertisements of the Jersey and Holstein breeds, and certificates of their enormous yield of milk, cream and butter.

Now, I am not disposed to question the truth of these statements, or contradict the value of these breeds to the promotion of our dairy interests, which I acknowledge that to a very considerable extent they may do, and have already done; but to examine to some extent what improved foreign breeds have done in many years past, as well as what they are now doing throughout the widespread dairy regions of our country.

The Short-Horns, under well recognized pedigrees, of purity in blood, were imported into New-England in 1817 and 1818, and within a few years afterwards into New-York, Philadelphia and Baltimore. The breed then had a high reputation as dairy cows They were not only bred among themselves in purity of blood, producing valuable milkers among their heifers, but the produce of the bulls used on native cows also made a decided improvement in the dairy yield of descendants; so that the Short-Horn grades from our common cattle became quite popular among intelligent dairymen throughout the districts where they were so bred and used, as they are also at the present time. But there now exists an essential drawback to the Short-Horns as connected with their dairy yield. Their remarkable flesh-taking qualities and early maturity soon found them making rapid migration into the rich grazing and corngrowing States west of the Alleghany mountains, where the milking qualities were of secondary value, and by neglect of them, in preference for flesh, both in thorough breds and grades, they have measurably lost their reputation and preference for the dairy. Yet in the more easterly States they still have a good reputation as dairy cows, both in thoroughbreds and grade, but are not advertised as superior to all others, although in many individual qualities they might truthfully be stated as the peers of any others, of whatever breed they might be.

The Devons were also imported into New-England, New-York and Maryland in the same years with the early Short-Horns. Although of much less size, yet beautiful in symmetry of shape and in color, they were equally good with the Short-Horns, according to their size and consumption of food. But from their lack of size, weight and early maturity, although in the latter quality not much deficient, they never attained the notoriety and wide-spread occupation in the western grazing regions so rapidly achieved by the Short-Horns. Of the valuable dairy qualities of the two breeds above named, I have had positive proof, in breeding them from the year 1834 to the present time with the Short-Horns, and upwards of twenty years with the Devons, in both thoroughbreds and their grades descended from our native cattle. I never used a grade bull from any breed during the fifty years of my stock farming, fully believing that the only way of true improvement is to breed from thoroughbred

bulls alone as the only sure way to *advancing excellence* in their produce.

The AYRSHIRES from Scotland were first introduced among us into New-England about the year 1822, and soon afterward into New-York, and possibly elsewhere, but not in any considerable numbers. They had wide reputation in their native country for the dairy. They proved good dairy cows in America, but not remarkable as flesh producers, and although they have sustained a fair reputation as dairy cows, have not won a wide popularity as a leading breed.

The JERSEYS, then called Alderneys, were from the small island of that name one of the British Channel Islands near the coast of France. They came to New-England about fifty years ago, and were few in number. They were selected by their public spirited importers for rich yield of milk and the superior butter made from it—the only quality for which they were esteemed, their bodies being diminutive in size, angular in shape, *outrés* in colors, lean in flesh, and with the exception of their attractive deer-like heads, rather ugly, in appearance. Yet their taking dairy qualities after a while spread widely their reputation. Within the last ten or twelve years importations by the thousand have been made, and flooded our own papers with advertisements, and the cattle widely distributed at public sales into almost every State of the Union, at prices hitherto unknown to any other foreign breed, except in a few notable sales of the Short-Horns.

The GUERNSEYS, from another island near to Jersey, of perhaps the same orginal blood as the Jerseys, have also been lately imported. but in much less numbers. They are larger in size than the Jerseys, of equally good dairy quality, better in flesh production, and, as they are bred and used, may be equally approved for the dairy.

Last of all but nearly equally prominent, the HOLSTEINS or FRIESIANS have come in upon us from Holland, some thousands in number, within the last few years, equally advertised and sold at both public and private sale at high prices, and widely distributed like the Jerseys. They are large in size, black and white in color, raw boned, large consumers of food, not highly fleshed as a beef-producing animal, but, as a rule, extraordinary milkers *in quantity* of weight and measure, although not of high quality—better for cheese than butter; a cow useful for the milkman to sell milk for family consumption.

Now to illustrate the wonderful faculties of these cows. Attending many of the advertisements of them are printed their portraits, with the most exaggerated udders—impossible udders, in fact—almost one third or one-fourth the size of their bodies, to impress the neophytes who gaze upon them with their marvelous development! Then a remarkable cow is selected from a number of fifty or a hundred other ones, while her product in milk, or more usually butter, is given in a certain number of days—scarcely more than a week—showing the extraordinary yield she has made, with no account of the food she has consumed during the trial, but no *average* whatever of the yield of the herd to which she belonged. The *average* I have often times inquired for, both in the papers where the extraordinary yields were published, as well as of other parties who possessed Jersey cows, but have never yet had an answer. How is this? Why not let us know the whole story of a *herd* production as well as of the favorite one so prominently shown up as a sample of the superior excellence of the breed at large? LEWIS F ALLEN.

Buffalo, N. Y.

Dangers of High Feeding

Laying fowls must be provided with fresh drink daily and light diet for the morning feed. The evils of heavy feeding begin to crop out at this season with pullets, and older ones manifest the weakness later as they come into laying. Then complaints are heard of such diseases as cholera, &c., when in reality the fault lies in the previous feeding. Oftentimes there are complaints of finding the fowls dead under the roost, sometimes with full, sometimes with empty crops. At the same time the keeper does not know whether the birds went up to roost the night before, or even for several nights before. He only knows that he has fed well, given corn in abundance, perhaps supplied drink each day, perhaps not The fowls may have had to obtain water either at the farmyard water-trough or by eating snow. This sort of poultry keeping among our farmers has been too common in former days, but I am glad to be able to think it has become the exception.

Heavy feeding of corn alone will not answer. Its evil effect will be seen sooner or later. Some may endure it and come out all right in the spring, but half the profit is gone. There have been no winter eggs, and these are one of the important items in the keeping of fowls at the present day. Even though the fowls may be comfortably housed and cared for, yet they may be too crowded and fed too high. Fowls require a change of feed often, and considerable coarse bulky food. There is a difference also in breed, but all may be forced to an excessively fat condition, which is always injurious, especially with young fowls that should be urged into laying at as early an age as possible after completing growth. The large, or Asiatic fowls in particular, after fully grown and matured, should have the rations of corn stinted, and be fed largely on coarse, bulky feed, such as moistened bran, wheat screenings, corn meal ground with the cob, &c., so that they may not gorge themselves with rich and fat-producing food, unless it is desired to fatten them for market. Plenty of vegetable and animal food is necessary to promote health, when the fowls will generally produce eggs.

Among evils of heavy winter feeding, is the weakening of the egg organs. In some cases the ovaries are entirely destroyed, and many times so weakened as to be unable to perform their function, caused by being loaded with fat in the earlier portion of the season. For this there is prevention, but no remedy.

—*Duchess County, N. Y.*

CONTROLLING HENS WITH CHICKENS.—I have tied my hens that have chicks, for the last five years, and never have seen any way of confining them that suited me as well. I select a place where there is nothing in which the hen can get entangled, and tie her to a tenpenny nail, which I drive into the ground full length. I set the coop just far enough away so that the hen cannot go around it. I use a noose to go around the hen's leg, made of soft leather, an old boot leg is good. A swivel is quite as useful in tying a hen as in staking a cow.

—*Country Gentleman.* A. O. C.

STACKS, STACKING, AND THATCHING.

I fancy that, even with our usual extravagance in seasons of plenty, a great part of last year's hay-crop will remain in our farmers' hands when the new crop is fit to carry. Where to put the hay of 1884, will be a question hard to answer; and I very much fear a great deal of it will be thrown up in *lumps* of one or two tons, left unthatched, and taken into the barn in the winter, when a good deal more than half of its goodness has been irrecoverably lost.

I will try, in the article I am now writing, to give a clear and concise description of the way we make and thatch stacks in the south of England—they are, generally, perfect pictures—only with the reserve, that the system of *roping* to fasten

down the thatch is a Scotch system, and the description of it is chiefly taken from Mr. Stephens' "Book of the Farm"; our southern plan of using splints and tarred rope being, I believe, more effective, but too intricate for any one to follow unless he has been brought up to it.

And first of *hay stacks*. before the crop is fit to cut, look out for a good place to build your stack on, it should be dry, and in a sheltered situation, for wind often strips the thatch off, and a damp bottom will cause the loss of several cwts of hay at the bottom of a stack Level the ground, else the stack, when heating, will very likely slip.

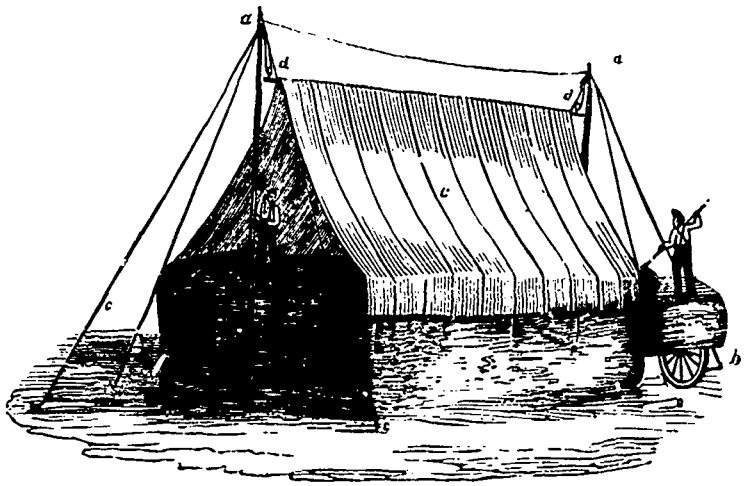

Fig. 1.

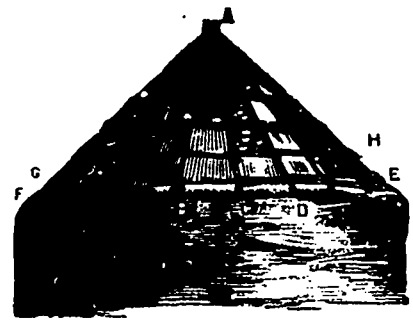

Fig. 2.

About two feet deep of rough bushes should be laid on the spot where you make the stack, and they should be neatly squared in, so that they may not protrude when the stack is finished: fourteen or fifteen feet is a fair width for a stack which, when subsidence is over, will measure twelve feet to the eaves from the ground.

With us, in the south of England, *all* hay-stacks are built under the shelter of what is called a *rick-cloth*, made of strong canvass, and mounted on a couple of poles, with gye-ropes, pulleys, &c. (v. fig. 1). An ordinary one costs about $80.00. In the dry climate of our province, this protection may not be necessary, but a *shed-roof*, so to speak, made of any light planking, running up four poles placed in a square, could be easily constructed; and when not wanted for a hay-barn, as in a bad season, it might be utilized for storing away implements, carts, &c. I have seen such things, and I believe they are called *Dutch-barns*.

The more workers there are on the stack the better: compressed hay keeps better than loosely packed hay. If the middle of the stack is kept full and the sides upright, the whole, after subsidence, will bulge out towards the eaves without any additional width being given to that part. When the body has attained a height of fifteen feet, or thereabout, the drawing in of the roof is begun by gradually taking in the breadth on each side to the ridge, and the ends are of course built up perpendicular. A low body and a long roof is a hideous spectacle. the building rule of one foot under the square is all right; thus if the stack is 15 feet wide, the square would be 7½ feet in height, one foot under which is 6½ feet, which ought to be the height of the top of a stack of that breadth. When your hay has been carried in good time, a strong heat will be perceived in a couple of days all through the body of the stack. Until this heat subsides, there is no use trying to thatch, as the hay may subside unequally, and draw the thatch open in places. The heating is advantageous for many reasons—the steam rising from one of our Middlesex or Kent haystacks in a cool morning would frighten a stranger out of his wits—the hay is made of uniform quality throughout, and, according to my ideas, the woody fibre is softened and rendered more digestible.

Before thatching, the stack should be trimmed by pulling out any loose straggling ends of hay, which ends can be thrown up on to the roof, where they will keep better under the thatch, and will not retain moisture on a wet or foggy day.

The thatching is done thus: straw is drawn into bundles in time, and ropes are prepared—don't put off these jobs till the stack is built—ferns, reeds. and any other tall-growing plants will do as well as straw. The thatcher having mounted on to the roof, the bundles of straw are forked up to him one by one as wanted, and each bundle is retained in its place on the roof, beside the thatcher, by leaning on or against a dung-fork stuck in the roof. The straw is first placed over the eaves, then handful after handful from the eaves to the ridge, each length of straw being overlapped by the one immediately above it. Should the thatcher feel a soft or hollow part with his feet, he should fill it up with some of the aforesaid trimmings. The straw is thus laid from eaves to ridge over a breadth as far as the man can reach at a time with his arms. At the ridge, straw is laid along it, to cover the ends of the thatch on the

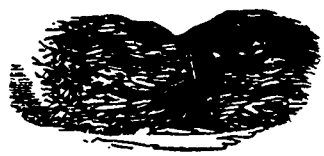

Fig. 3.

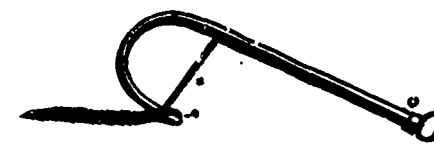

Fig. 4.

sloping roof, and to support the ropes which are to keep down the thatch.

When this breadth of, say, two feet, of the thatch is laid, its surface is smoothed down with a *comb*, i. e. a bar of wood of about 3 feet long, with teeth of wood, or preferably of iron, about 4 inches apart, and then a rope is thrown across the stack at its end, and another parallel to it at about 10 inches apart, and made fast at both ends to the sides of the stack. Other ropes, at right angles to the first, are fastened, 18 inches apart, to the end of the stack, and each of the horizontal ropes is twisted once round every perpendicular rope it meets, so that, when finished, the roping has the appearance of a square-meshed net, (v. eng. 2). The eaves are completed by laying a stout rope horizontally along the line where the drawing-in of the roof was begun, and twisting it round each perpendicular it meets; the perpendicular ropes are then broken off and fastened firmly to the hay immediately under the eaves.

Fig. 5.

Round haystacks I object to on this account: if you begin to cut them to take the hay into the barn, a strong blast of wind will very likely strip the thatch, and blow half the hay all over the country. When a stack of hay is properly trimmed, the strongest man cannot pull a handful of it out—no, not the *Girt Jan Ridd* himself; v. "Laura Doone." A stack of well made hay, carried in proper season, and well tramped down in the building, should, if 15 feet in the stem when finished, subside to 12 feet.

BUNCHED STRAW FOR THATCHING.—In Somerset, and in the West of England and South Wales, the thatching of stacks is carried to perfection. The ears of wheat are drawn together

Fig. 6.

by means of a comb, with teeth pretty close-set, and cut off: the straw, then called *reed*, is unbroken by threshing, and keeps the stacks under its care free from all danger of wet. This practice is too much of fine art for us; we must take the straw as it comes from the machine, and do the best we can with it. Some preparation, however, it must undergo, or else our work will be very ragged; let us take Mr. Stephens' plan:

"The man takes a wisp from the mow, and places it across his body, and after making the straws straight, first with one hand and then with the other, he takes hold of each end of the wisp, and spreading out his arms, separates the wisp into two portions. Bringing both hands together, he lays hold of the severed wisp with the left hand, and taking hold of its other end with the right, draws the straws asunder as before. Bringing again both hands together, he goes through the same process, and as often, until he sees that the straws are parallel and straight, when he lays down the now drawn wisp carefully

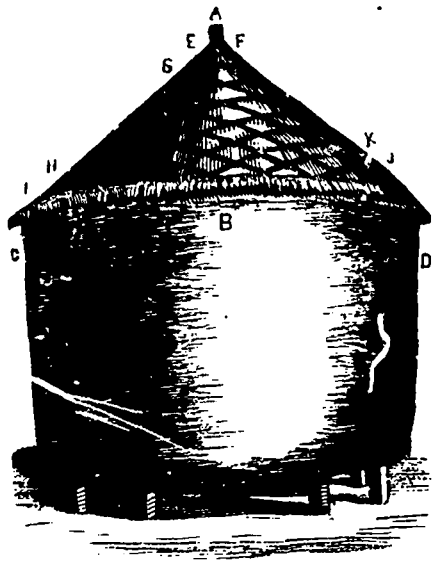

Fig. 7.

on the ground. When as much has been drawn as to make a bunch of about 15 inches in diameter, the man makes a *thumb rope*, by twisting a little undrawn straw round the thumb of his right hand, drawing it out with his left and twisting it with his right alternately, until a short rope is made, with which he ties up the bunch of drawn straw as a sheaf of wheat is tied": (v. eng. 3).

STRAW ROPES—are made by the bow or crook. This simple tool (v. eng. 4) is made of a piece of tough ash, about 3½ feet long, bent into a curve, and retained in that position by

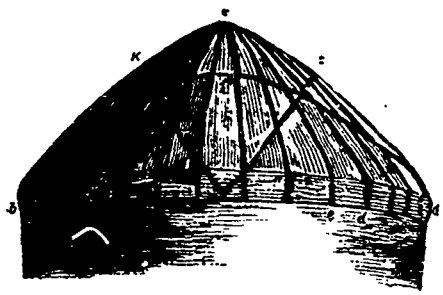

Fig. 8.

a stout string. In using this implement, the rope-maker sits near the straw (v. eng. 5), and the spinner with the bow moves backward as the rope grows in length. It is quick work, and easy enough for an old man and a small child, as in the illustration but a little practice is required or the rope will be too tightly twisted or too slack—in both cases it will break.

Straw is twisted into ropes in this manner: the left hand of the twister holds by the end of the shank of the bow, and the right hand by the middle of the shank: on the spinner placing a little drawn straw in the angle *b* of the bow and cord

(fig. 4), the twister makes the bow revolve round an arc, and walks backwards. The spinner sits on a stool, or on a bundle of straw, and nearly closing the left hand, lets out the straw gradually between the finger and thumb, retaining it until sufficiently twisted, while the right hand is engaged supplying small portions of straw in equal and sufficient quantities to make the rope of uniform thickness throughout, the twister drawing it away with her as fast as the spinner lets it out. When the rope is let out unequally, it breaks at the smaller part; when twisted too much it snaps; when not twisted enough it tumbles apart at the least pull; and when the twister does not keep the rope straight as fast as it is let out, it gets into *kinks*, like an ill dressed fishing-line, and is not easily made straight again.

Fig. 6 represents a straw rope coiled up. When the ends are made smaller than the middle, the rope can be easily taken hold of and carried, and when the form is oval rather than spherical, the coil can be more easily thrown upwards to the top of a stack.

Figs. 7 and 8 show two other modes of roping the thatch of a stack. In Cornwall, where winds run high, I have often seen the ropes kept down by heavy stones tied to them. It does not look pretty, but, in practice, is efficient enough.

ARTHUR R. JENNER FUST.

Ensilage in a Milk Dairy.

EDS. COUNTRY GENTLEMAN—Having received so many inquiries in regard to the construction of our silo, and of our manner of feeding, &c., we concluded to write you a detailed account of it for publication, and thus benefit many who have not written directly to us. In the first place, we knew nothing of silos or ensilage, except by reading accounts in agricultural papers from those who gave their experience with them. The greatest drawback was the cost of building a stone one, and having plenty of room in our barn, we conceived the idea of boarding up a bay for a silo, so as to make it tight. We made inquiries of men who had silos, and upon their advice we began it one year ago last June. We first placed tarred paper upon the studding, then over that we placed matched spruce planks 1¼ inches thick. This bay was in a barn which was 20 by 24 feet, and about 20 feet deep, being all above ground. Around the bay under the sills we built a wall of stone and cement, and cemented the bottom, so that it was as smooth and hard as a floor.

In September we began filling, and owing to lack of help we were about three weeks putting in about 120 tons. After filling, no weight was put on until we began husking corn some time afterward. Then we piled the stalks upon the silo. We said that no weight was put upon it, but we will modify that a little by saying that we placed over the top tarred paper and rough hemlock boards. We had some misgivings as to its keeping well, so we opened it about a month after filling, and great was our surprise to find the fodder in splendid condition When given to the cows, they ate it ravenously, and did not leave a particle in their mangers. A great many of our neighbors laughed at us when we were filling the silo They said that "the stuff will be all rotten by spring." We replied that we expected it would be, but we intended to put it through the cows first. After opening, we could laugh at our neighbors, as the old saying is that "those laugh best who laugh last." We found several tons of the fodder spoiled in two corners that were not exactly air-tight; the remainder was in splendid condition.

Being so well pleased with our success with the silo, we sowed a large field of corn again last season, but, owing to the dry weather, we did not have a very large crop, and the frost came before we had the fodder all put into the silo. We put in what we had, in just a week, and did not cut the stalks as short as last year. Last year we cut one-quarter inch: this year half an inch. We find that the ensilage is, if anything, better this year than last. We are now feeding twenty-five cows for milk, and find that upon the following ration they give as much milk as they would if in good pasture: About 6 o'clock in the morning they are milked, and then fed one bushel each of ensilage, upon which we put four quarts of buckwheat bran. At 9 o'clock they are turned out into a yard to drink and exercise, while the stables are cleaned and fresh bedding is put in, which consists of the manure from the horse stable, wheeled in and scattered in the trench to absorb the urine. The manure is all thrown into a building prepared expressly for protecting it from rains. At 11.30 o'clock the cows are put into the stables and fed one peck of carrots, and all the timothy hay they will eat. At 4 o'clock they are again milked and fed the same as in the morning.

We are getting as much milk by feeding ensilage, and a small amount of grain, as we would get on good pasture. For the purpose of comparison we will state that one of our neighbors is feeding cows for milk also, but he does not make ensilage of his corn fodder, but shocks it in the field and leaves it until he wishes to use it, then draws it in and runs it through a cutting machine. His rations are all the cut fodder the cows will eat, and a peck of buckwheat bran at each meal. You will thus see that he is feeding three times as much grain as we are. We fed slops up to December 1st, and then it became so cold that the slops would freeze at night, therefore we concluded to try dry bran, and are perfectly satisfied that cows will give fully as much milk on dry bran as they would on the same mixed up with water. In conclusion we would recommend to any farmer who keeps five or more cows to build a silo, believing that he can save enough in grain to pay its cost in one year.

HARDIN BROS. *Scotia, N. Y.*

Early Maturity--Full Feeding.

After so much has been written upon this topic for the last few years, it is not surprising to find in the agricultural department of the New-York Times such reasoning as the following: After stating that by early maturity, pigs, sheep and cattle may be given the proper weights to fit them for slaughter in half the old time required, it says: "But it is a question if this forcing is profitable, either to the feeder or the consumer. On the one hand, the animal is forced to consume as much food in two years as was formerly spread over four years, so that, on the whole, there is no gain but in time; while on the other hand, the consumer has very immature and half-grown meat, which is devoid of flavor and nutritive quality, and the meat is overloaded with fat, which is a waste. Physiologically, it is a matter of do ubt if the muscular growth of an animal can really be hastened by any process of feeding. Fat can be produced, no doubt, but fat is a diseased condition of the system, and an excessively fat animal would soon die under continued feeding. * * On the whole, it certainly does appear as if we had carried the forcing system of feeding to an unprofitable extreme."

It does not seem probable that this statement was carefully examined by the editor of that department of the Times It is stated here that the steer that has matured in two years has eaten as much food as if it had taken four years to attain the same weight. This is leaving out of the account the entire food of support for two years. The writer of that statement ignored the first principles applicable to the growth of animals. The food of support represents from 55 to 66 per cent. of a full ration. Two-thirds of the ration is usually estimated as the food of support, and from one-third comes all the growth.

The food of support alone to a steer, for the second two years, would probably be quite equal to the entire food eaten by the steer the first two years This was proved by the prizes at the last Chicago Fat Stock Show in the class on "*cost of production.*"

In the three-year-old class, J. D. Gillet's steer Mammoth took the prize, weighed 2,445 pounds, and cost $214 53, or 8.77 cents per pound. In the two-year-old class, the first prize went to the heifer Hattie, weight 1,135 pounds, cost $58.18, or 5.12 cents per pound ; second prize to steer Dan, weight 1,505 pounds, at a cost of $78 35, or 5 20 cents per pound In the one-year-old class first prize went to steer Stonington, weight 1,160 pounds, cost $47.11, or 4 61 cents per pound ; second prize to steer Arthur, weight 1 04.5 pounds, cost of production $44.43, or 4 25 cents per pound.

Here is a most instructive exhibit, not of theory but of fact The three-year-old steer Mammoth cost more than double per pound of the year-old steer Arthur. It is sure that the cost of production bears an almost uniform ration, according to age. It does not give much aid to the statement of The Times, that a given weight made in two years will cost as much food as if made in four years. No, this idea is totally without foundation, and it is most important to economical feeding that this old idea should be exploded, and wholly banished from the American feeder's mind. It has cost American agriculture more than one thousand millions of dollars during the last half century. It had possession of the minds of some of the best feeders but a few years ago.

Prof Morrow corrected a statement of the writer in the COUNTRY GENTLEMAN in reference to the system of the great Illinois feeder, John D. Gillet, that he never allowed the calf to slacken in its growth till he was ready for market, by giving a conversation with him, in which he said he did not care to have the calf pushed the first winter, thinking it no harm if it came through rather thin.

Well, since that Mr. Gillet has exhibited at five fat stock shows, and he was reported about a year ago as saying that he had become convinced that it was bad economy to feed to three and four years, and that the calf should be full fed every day of its life till ready fo. market.

That fat stock show is the most important school of reform in feeding ever established in America. It has done more to produce definite ideas on alimentation than all the agricultural colleges in the country. If people will study the figures of these shows, they will soon get all the notions about storing animals out of their heads.

Then the talk about the "forcing" system is all wild. Is it forcing an animal to give it what food its natural appetite craves ? I believe cramming, as with turkeys, is not practised The criticism on surplus fat is well taken, but this does not apply to year and a half olds more than to three-year-olds.

Some of the oldest animals at the Fat Stock Show were the fattest. This disproportion of fat is attributable to errors in feeding, not to the ages of animals. It has been proved that steers and heifers twenty months old, fed on a regular system in England, gave a quality of meat greatly liked by the very best consumers—the meat being found nicely marbled and juicy.

The principal cause of too much fat is owing to the excessive feeding of Indian corn—our greatest fattening food. The English feeder gives a proportion of rape cake, linseed and cottonseed cake, malt sprouts, bean meal, barley, &c , containing a large proportion of muscle-forming matter.

The muscles and frame are grown rapidly, and abundance of fattening material is found in the oil of the cake, in the barley and corn meal which make a part of the food. Mr. Gillet modifies the corn ration by his splendid blue grass pastures. He makes the most of the summer, gives to his steers all the corn and grass they will eat—the corn being in troughs scattered over his pastures. He now believes in maturing the beef animal at the end of two years. E. W. S.

Lake View, N. Y.

POULTRY DEPARTMENT.

Hints for the Novice.

EDS. COUNTRY GENTLEMAN—The troubles of the poultry-keeper, especially if new in the business, begin when disease sets in. Roup, in its many varied forms, is the disease most to be dreaded. The symptoms are seldom twice alike. Those not familiar with it do not discover it until too late, when the victim is too far gone. In the seasons of sudden and severe changes of weather, there is great danger of the fowls freezing, as well as of colds. Then there is dampness and chilliness on many days, which cause colds. The fowls should be well protected by tight rooms, under a good roof, with matched siding, well battened. The fowls then fare much better in severe cold than when the temperature is higher.

Some varieties or breeds have been considered tender, because they were not understood. The Houdans are an example of this fact. They can endure almost any dry cold weather, but are not proof against dampness, even with a high temperature. Indeed, no variety of land fowls can endure dampness and remain in health. I mention the Houdans, as they are often thought too delicate for common farmers' use. There is no denying the fact that the fowls of to-day are more delicate and tender than those of a preceding generation, but admitting this fact, are they not double or quadruple the value, as far as profit is concerned ?

Localities and markets vary, and the breeds must vary accordingly in order to suit the demand of the nearest market. Early flesh-producing varieties are in demand for broilers, and these breeds are at the same time the great egg-producers. Some markets demand white-fleshed fowls, and also white eggs, while another wants only the yellow-skinned carcases and brown or coffee-colored eggs. With a correct taste there is a difference. Yellow-skinned fowls never possess that sweet tenderness of flesh that is met with in the white-skinned sorts.

There are always weak fowls to be found in every lot, and such are the first to be attacked with disease. Some varieties are perfectly hardy with the exception of liability to become frost-bitten in low temperatures. Other sorts cannot endure confinement and high feeding. With the right management the Asiatics are the best for the ordinary keeper. They possess size, and will give a goodly number of eggs if fed aright during the winter. They require quantity rather than high quality. The beginner is apt to be disappointed with the breed when meeting disease, but this is wrong, for no breed is exempt. All birds should not be treated alike.

Duchess County, N. Y. C B

Diphtheria from Chickens

EDS. COUNTRY GENTLEMAN—I notice and extract from the London Times in a New-York paper, stating that a German professor (Gerhardt of Wurzburg) has determined to his satisfaction, by experiment and observation, that diphtheria is sometimes communicated to persons by means of fowls. This will be a new idea to many people, but after all ought not to surprise. Fowls frequently have throat diseases, which sometimes kill them, and as diphtheria is attributed usually to some want of cleanliness about the premises, when it cannot be traced to contagion from some person, it should be an additional reason to all who keep fowls to give them more attention in the way of cleanliness. And want of cleanliness is, after all, the cause of more fail-

ures with fowls than probably any other one thing. In addition, if diphtheria can be traced to this cause, one would suppose that every possible precaution would be taken to guard against it, though of course it will not.

The stables set apart for horses and cattle are cleaned every day, and sometimes several times a day. It is not always done in the best manner, or in a manner to make the best use of the excrements, but it is done generally as a matter of course, and without complaint about "the trouble." But when it comes to fowls it is very different. In the first place no pains are often taken to so arrange the roosts that the droppings can be readily scraped or shoveled away, or even covered or mixed with some disinfecting substance which makes it safe to let them accumulate for a few weeks. They are simply let alone and allowed to accumulate, not only for weeks, but for months and even years. Fermentation sets in after awhile, or very soon in warm weather, chemical changes occur affecting the commercial value, disgusting odors arise which first affect the fowls, and then are wafted over the neighborhood, and insects of many kinds are bred in the pile, some of them hen-lice, and these at once attack the fowls. In many cases "hen-cholera" is developed, and then the owner wonders and mourns at the extraordinary run of "bad luck" he is having, though I cannot see that there is much luck about it. It is about as natural a result as it would be to make the cellar of his house a dumping place for vegetable and animal filth year after year. In fact, the latter would be less pestilential, as the tight floor of most dwellings, with a second, and sometimes a third floor above, is a partial protection; but the filth under a hen roost goes straight to the fowls above, unless a friendly breeze sends it in another direction.

Roup is a form of diphtheria, as any one will see who notes the swelled throat and eyes of the suffering fowl, and its painful attempts to breathe. The exuding fluid or moisture from the mouth and eyes is undoubtedly poisonous as is probably the breath also. The rule is to exclude all sick fowls from the flock at once, which is right, but not enough. It is far better to exclude all causes of disease, and thus prevent it. A sick fowl is a poor thing to spend time on in doctoring. Its value is slight at most, while to attend properly to it requires about as much time as a horse worth more than a hundred fowls. In general, fowls of only ordinary worth had better be killed as soon as they are seriously sick, as a man whose time is worth a dollar a day to him cannot afford to spend many hours on a sick fowl. But in works of cleanliness he works for his whole flock, and also for his family. He promotes health and neatness, and this ought to be as great a pleasure to him as it usually is to see his house kept in neat order by a tidy wife. The slip-shod indifference to the appearance and condition of outbuildings and premises, so often manifested, is disgusting and disgraceful, and the quarters set apart for fowls are usually the worst of all. That there is a close relation between such premises and the health of rural families admits of no doubt whatever. Farmers have advantages for health which no possible care in the great cities can equal, and when they heedlessly render them nugatory by carelessness, they have none to blame but themselves. S. I.

Philadelphia, Pa,

Raising Ducks with Profit.

Eds. Country Gentleman – Ducks can be kept and raised quite as profitably as chickens, with only water sufficient for drinking purposes. Indeed they become a greater source of profit if limited in their runs. They consume a large quantity of food if allowed access to it, but after a certain amount the surplus food is rather a disadvantage, and should be kept from them, for it is consumed at a waste. Ducks should be kept separate from the other fowls, as they are apt to create disturbances. Ducks are great foragers, and will live largely on insects, like other fowls, if kept from the neighborhood of running streams When once given access to a running stream, they become difficult of control. If kept like other fowls, they give no more trouble.

There are many varieties of ducks, but the common gray duck is about as profitable as any. They are good layers, and the young mature early, and are fit for market by midsummer, when they bring good prices. A duck will lay from 14 to 16 eggs, when she will sit The period of incubation varies from 26 to 28 days, according to the weather and the steadiness of the sitter. Ducklings are not hardy, indeed, I think they are more delicate than our common chickens, until fully feathered. The growth of young ducks is very rapid where well fed, in which case they are quiet, and are little trouble if given a place of resort where they can do no mischief. They are mischievous if allowed access to the garden, as they will destroy the young vegetables. If given a place by themselves, with a shallow trough of water to bathe in, renewed daily, they will give no trouble when well fed. The mother will lay two, and where well kept, three clutches of eggs, which may be put under hens, if it be desired to keep the ducks in laying, which they will do if well fed, and also mother the ducks of the first hatching. Ducklings that are raised by the natural mother are the more profitable, as she leads them in ways agreeable to the instincts of their nature.

Ducks' eggs always command high prices in the market, and are valuable for home use. Ducks do not pine in confinement, but take to their quarters naturally, providing they are kept furnished with food and water regularly. The feathers of ducks are worth more than those of the turkey or fowl. When given full run of all the premises they, as well as other fowls, become a nuisance. There is no need of it. Ducklings should be fed much the same as young chickens, and like them are fond of green food. C. B. *Duchess County, N. Y.*

Champlain Valley Bee-Keepers' Association.

The Champlain Valley Bee Keepers' Association met at the Addison house parlors, in Middlebury, January 10th. The meeting was called to order at eleven o'clock by the president, J. E. Crone, and, on motion, V. V. Blackmer was made secretary, *pro tem.* The chair then appointed a committee on nominations, and another committee was appointed to introduce topics for discussion. The committee on nominations reported as follows: For president, H. L. Leonard; vice-president, E. P. Wolcott; secretary and treasurer, J. E. Crane. The persons placed in nomination were unanimously elected by the association, and President Leonard was conducted to the chair. The president then made a short speech, expressing his thanks for the honor shown him. He also alluded to the prominent part the association had taken in the upbuilding of the honey producing interest in Addison county and vicinity. The meeting now being open for business, Mr. Isham asked:

"Is it desirable to exchange queens with other bee-keepers for the benefit of their apiaries?" President Leonard thought it was not desirable. Secretary Crane thought it might often be of great benefit, as he had more respect for black bees after having used them in some of his apiaries the past season. The next question propounded was: "Will some strains of bees of the same race prove more productive than other strains, or will some colonies of bees, with the

same care (which are in same condition in the spring), be more productive than others?" Dr Bond thought the difference was owing to good crosses, or the innate good qualities of some strains of bees, and that such good qualities should be perpetuated by careful breeding. Mr. Forbes said colonies that were in equally good condition in the spring would vary greatly. Remarks were also made by Messrs. Blackmer and Smith. Mr. Blackmer asked which had wintered best, the black or Italian bees? He was answered by E. Smith and G S. Brown, who were in favor of the black bees Mr. Isham gave his experience with these two races of bees; had found, the past season, that Italian colonies had given him an average of thirty two pounds of comb honey to the hive more than colonies of black bees, and a corresponding increase in swarms. R H. Holmes inquired: In what respect do black bees winter best?" and was answered: "The Italians die, while the black bees do not." The secretary's experience had been different, the Italian bees wintering better with him than blacks. A recess was then taken until half-past one o'clock

AFTERNOON SESSION

At the opening of the afternoon session, a report from those present was called for by the president, and much interesting information obtained, which is given in the table below. The first three columns of figures give the number of colonies of bees each party had at the different periods named, and the last column give the number of pounds of comb and extracted honey produced:

Names.	Fall of 1882.	Spring of 1883	Fall of 1883.	Pounds.
H. B. Isham.....	...	10	19	.....
E. P. Wolcott.....	61	60	89	7,000
Dr. Frank Bond...	83	14	21	100
F. B. Sumner.....	65	43	75	3,300
J. I. Clarke..	47	42	76	3,000
L. C. Thompson..	65	58	150	5 000
Edson Smith	67	63	116	4,500
J. D. Brooks.....	85	82	.....	5 000
E. L. Moody. ...	..	5	16	.....
J. H. Mead.. ...	25	15	26	1,500
V. V. Blackmer..	60	27	64	3,125
A. P. Needham..	35	15	33	1.000
George Smith.....	65	50	38	4,000
M. Sturdevant.....	...	32	65	.....
G. C. Wicker.	4	3	6	250
G. S. Brown. ...	65	37	53	.
V. N. Forbes.....	29	19	38	1 200
R. H. Holmes	8	4	7	200
J. E. Crane....	400	300	438	26,500

The president then called upon Mr F L. Ripley, of Boston, for his views relative to preparing honey for market Mr. Ripley read a short paper on this subject, which will be found elsewhere in this department. He was listened to with the deepest interest by all present During the reading of the paper he was frequently interrupted with questions, which were answered to the satisfaction of all. On motion of D-Bond, a unanimous vote of thanks was given Mr Ripley for his interesting paper, and he was made an honorary member of the association. It was voted to give the ladies present who were interested in the production of honey the privilege of becoming members of the association without paying the usual fee. The topic, "The best way to build up weak colonies in the spring was then taken up. Mr Brown stated that he had not been successful in doubling weak colonies in the spring; found it better to take a comb of brood from a strong colony and give to the weak one. Mr. Isham preferred to let the strong ones alone, and take from the weak ones. Edson Smith said: "I take two medium swarms and then take from them to help up the weak ones." Other members seemed to prefer doubling weak colonies. The next topic was, "How far apart should large apiaries be located?" J. D. Brown said he had "lined" bees for five miles, but lost many of his bees by their crossing Lake Champlain. His apiary is located on the lake shore, and the lake is three-fourths of a mile wide at his place. President Leonard thought large apiaries should be located at least four miles apart. On the topic, "Which is best, a hive with a dead air space or a chaff-packed hive?" various views were expressed, but the secretary was unable to report them all. President Leonard thought the chaff-packed hives were the best. "What machine is best for making comb foundations?" was the next subject for discussion. H. B. Isham thought the Given press the best; had used, the past season, the Vandervort, Van Deusen, Dunham and Given He governed the thickness of the sheet by dipping. R. H. Holmes asked if the wax sheets were not thicker on one side than the other if dipped but once? E. L. Moody said: "I dip three times for a heavy foundation." Mr. Beach inquired if foundation was as good after standing for some time? J. I. Clark replied, "When honey is coming in fast, I think it makes no difference." H. B Isham said it did not matter as much about the age of the wax as the quality of it. J. H. Mead asked what conditions would injure comb foundation. Dr. Bond thought it should be kept from the air, and other members said it should be kept dry. The last topic taken up was, "What advantage have the Cyprian bees over other races?" Mr. Isham thought their strongest points were their stings, and this seemed to be the experience of all who had had anything to do with them The meeting then adjourned to the second Thursday in January, 1885. The attendance was good, about forty persons being present. Some fine samples of honey were on exhibition, as were also samples of foundation and piece-sections.

J. E. CRANE, *Secretary.*

A MICHIGAN CONVENTION.

Wintering the Bees—Honey.

EDS. COUNTRY GENTLEMAN—The Northeastern Michigan Bee-Keepers' Association held its second annual convention, March 5th, at Lapeer—thirty-six members being present. The first topic brought up for discussion was that of Wintering Bees. Mr. August Kloppen said that in a good warm hive bees will winter all right. Mr. Walker said that he is this winter using an outer, removable protective-shell, made of a peculiar kind of building paper, but he considers the kind of winter stores of more importance than anything else. W. F. Card said that bees in old box hives, full of cracks and holes, often winter better than those in well-made and painted movable-comb hives. W. Z. Hutchinson first digs a trench in a sandy hillside, fills it with dry straw, lays fence posts across, places boards over the posts, and then sets the hives in rows upon the boards, surrounding them with straw. Fence posts are then placed over the hives, their upper ends touching like the rafters of a building, straw is thrown over the posts to the depth of a foot, and then earth is shoveled on to the depth of two feet. No opening is left for ventilation. He had been more successful with this method than with any other. He now has 57 colonies in such a "clamp." W. Wray buried two colonies one year, giving them slight ventilation, and they wintered well. He has 54 colonies now in a clamp, with slight ventilation.

C. E. Rulison buried six colonies, giving slight ventilation, and only three of them survived the winter, and the combs

of all of them were very mouldy. He had also tried the experiment of extracting all the honey in the fall from a few colonies, and feeding them syrup made from granulated sugar. They were not protected, and scarcely flew during the winter, but came through in fine condition. Mr. M. D. York was satisfied that bees wintered in chaff hives should not be too closely covered up. When bees are so uneasy as to hang out at the entrance, he quiets them by raising the chaff cushion with which they are covered. To learn how one man had successfully wintered his entire apiary when others sustained heavy losses, Mr. Ira Green had paid $5. The secret was abundant upward ventilation.

The secretary then read a paper from Dr. L. C. Whitting on the production of comb honey. The writer's advice was to have the colonies strong at the commencement of the honey harvest, and, if possible, to have a few combs in some of the sections first given to the bees. When the sections were added, he would reduce the size of the brood nest, thereby crowding the bees into the section boxes. Should a swarm issue, he would hive it in a new hive and place it upon the old stand, moving the parent colony to a new location, and removing the section boxes from the old to the new hive At first he would give the swarm few brood combs, thereby crowding the bees. He also advised the employment of reversible combs or frames.

The advantages of reversion are that the combs are thereby more firmly fastened to the bottom bars, and honey that has been stored in the upper part of the combs will be removed to the section boxes. Comb foundation should be used for starters; the opening between the sections shonld be at least half an inch, and no more room should be given in the sections than the bees can fill.

L. D. Gray crated his bulged sections by sawing up empty sections and putting the strips between the thick combs. C E. Rulison had for a long time been in favor of separators, but was at length compelled to admit that they could be dispensed with. M. D York had provided a portion of his hives with separators, but in those without separators work in the sections was commenced much sooner. He had also removed partly filled sections from hives without separators, and given them to hives having separators, and the empty sections put in place of those removed were filled sooner than the partly finished ones placed between separators. He had used wide frames quite extensively, but should discard them for cases. When wide frames containing two tiers of sections are used, too much room must of necessity be given at one time; the tier of sections was finished first, and became travel-stained before the upper tier was finished, while the sections are difficult of removal. President Taylor agreed with Mr. York

W. Z Hutchinson then read a paper on the use of cane sugar for winter stores. For several seasons he had experimented by extracting the honey, in the fall, from some of his colonies, and substituting a syrup made from granulated sugar. In some winters the colonies wintered all alike, in others, the superiority of the sugar as a winter food was very marked The feeding was done in the latter part of September and early part of October. Mr. August Kloppen thought that this plan might be adopted by those who were in need of amusement! President Taylor replied that it is of no use to those who can always winter bees without loss, but to those who can only be certain of success by so doing it is exceedingly profitable. C E Rulison had extracted one hundred pounds of fall honey, sold it at 12½ cents a pound, bought granulated sugar at 9 cents a pound, and from two pounds of sugar had made three pounds of syrup.

Mr W. Wray would like to know why bees in old decayed box hives, full of cracks, usually come through the winter all right, while they often perish in well made chaff hives. B. Walker said that old box hives usually contain well ripened stores, when with movable comb hives, the best of the honey is usually removed each year. Mr. Green thought that the abundant ventilation afforded by the dilapidated old box hives is what causes their inmates to winter free from dysentery. C. E. Rulison thought that the different results were caused by differences in the food. With movable comb hives the best of the honey is removed, and the bees allowed to fill up their combs with fall honey for winter stores President Taylor said that bees in box hives fill up their hives with good honey, the apiarist cannot remove it, and when fall comes there is not room in the hives to store much honey or pollen. M. S. West referred to a statistical table published in 1881, showing that bees in box hives fared the worst. W. Wray thought that moisture is often the cause of dysentery among bees, and that the ventilation afforded by the cracks in old box hives prevents the accumulation of moisture If improper food caused the wintering losses, he would like to know why bees in the same apiary, with the same kind of food and management, passed the winter so differently. W. Z. Hutchinson said that there might be a difference of stores, even in the same apiary. Colonies differ in age, and consequently part of the honey of some of them is stored in a different season from that of others. When Italians are working upon red clover, the black bees in the same apiary are often storing honey from buckwheat, and even colonies of the same variety, in the same apiary, do not always gather from exactly the same source. One winter Mr. Green had brought home sixteen colonies from one apiary. They were all in box hives, and one hive was very dilapidated. He filled the holes in this hive with wool, and only in this hive the bees survived. He attributed the success to the abundant ventilation. W. Z. Hutchinson.

—*Genesee County, Mich*

More experiments yet called for

After all the numerous, important improvements realized in bee culture, still the more advanced investigators seem disposed to proceed under the impression of not having yet fully apprehended all the conditions and elements of attainable success. While the many experimental failures seem to almost suggest doubt as to the desirableness or prudence of proceeding in this direction, yet it may be asked, how else can we reasonably hope to attain to the knowledge essential toward placing our beloved bee keeping as to result above a peradventure?

In fact, sometimes from even a grievous failure; much may be gained in discovery of what may have been the mistake causing the disaster. We would be loath to admit that most of the worst cases of failure and "blasted hopes" might not have turned out under other conditions very differently.

Surely there are for instance certain laws and conditions of safety in wintering which, if only well enough known and possible to fulfil, we might with ample confidence count on the number to be brought through all right. Now facing winter must we look wintering in the face.

However, it does look rather humiliating to admit that with all the skill and experience here employed hitherto, yet so many of us are earnestly asking one another (and feeling need to ask), "How are you deciding to winter?" Now this is just what we are driving at. We do well to more freely and fully than ever inform each other, and every time give the why and the wherefore. Whatever may be the seeming confusion and conflict of theories, still we are even so on the hopeful way in the search for the better. Thus as we cautiously proceed, keenly watch results, and candidly admit errors, may we all become wise and more successful. Will some of the very successful Ontario apiarists who really know which, or what is best, instruct. Whether shall we have top or bottom ventilation? How much? and how? and why? Each of us being resolved to be right or to be set right.

PLAN OF CATTLE BARN.

TO THE GAZETTE :

Under the head "Items," in your last issue, Curtis Holgate & Co., of Defiance, Ohio., write you regarding a plan of barn which you published in the first volume of your most valuable paper. Had frequently heard subscribers to THE GAZETTE speak of the plan referred to, and I should be very glad to get it. Have been a reader of THE GAZETTE since last June, and let me say that it would take considerable cash in hand to induce me to part with it. CHAS. E BENNETT.

REPLY.—The barn alluded to by Messrs Curtis Holgate & Co., as well as Mr Bennett, is undoubtedly that of Mr. E. W. Payne, of Morrisson, Ill, illustrated by us April 6, 1882, from drawings furnished by the owner. It is seldom that we find space to re publish anything that has previously appeared in our columns, no matter how long a period may have elapsed since the original publication was made; but the plan referred to above is of such a simple, practical nature, that we feel disposed to accommodate our present correspondent as well as hundreds of other new readers, by again inserting the plates with Mr Payne's description. This is rendered necessary from the fact that our edition of THE GAZETTE in which the plan originally appeared, is entirely exhausted. Mr. Payne's description is as follows:

It is strictly a cattle barn; is set upon concrete piers, made of cement and gravel, each pier standing upon a footing 2x3 feet, and 6 inches deep, made of best Portland cement to resist frost. These piers are 2 feet long, 14 in. thick at bottom and 10 in. at top and 18 in. high, standing 10 ft. to centres, and are made of Louisville and Akron cement and gravel. I think they cost more than stonework would have done, but the expense might have been lightened by using some quicklime. The sills are 8x8, and lower joints 2x8. The main barn is 32x80, and built after a design of my own. The bents of the frame are 10 ft. to centres, and each bent is constructed of two 2x6 studding for each outside post, and the inner posts, which slope slightly outwards at the top, with a tie joist reaching through from outside to outside, spiked between the two studding. These bents are fastened together by ribbons 2x6, gained in a half inch, and are gained into the studding 1½ in., bringing the ribbons flush. The second joists are supported by a 4x4 cut between the inner posts and beveled on top to take the bearing of the joists, and are supported by three 2x6 studding for each 10 ft. set upon the sill and cut under the ribbon and 4x4, these short studdings being set at the same slope as the posts, and 3 ft. 4 in. to centres, which is the space allotted to each animal. The hay loft is clear from floor to peak, in which a track is constructed and Porter's hay carrier used. The hay is mowed between the bents at the sides with very little labor. The track does not extend outside of the barn, and no difficulty is found in operating the carrier six feet to one side of the load. The floor is divided into double stalls 6 ft 8 in. to centre, and the partitions extend across the manger. Cattle are tied to chains attached to an iron staple at the side, upon which the chain can slide up or down sixteen inches. A feed alley runs through the whole length of the main barn, cattle standing with heads to the centre. There is on one whole side an addition of 16 ft. wide arranged in stalls and a box stall for a bull, which opens into a yard for exercise, as shown in the diagram.

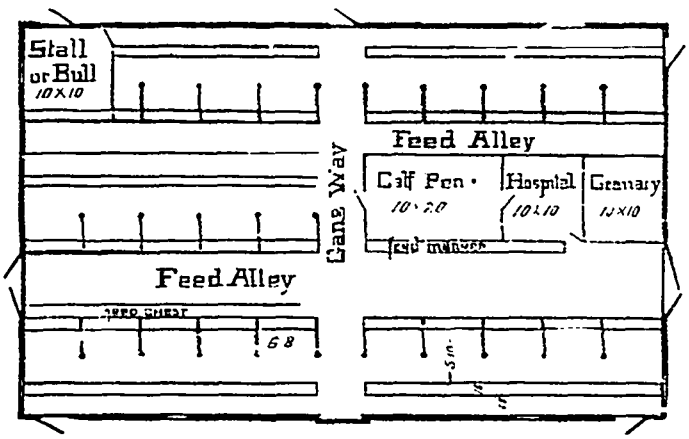

Fig 1.

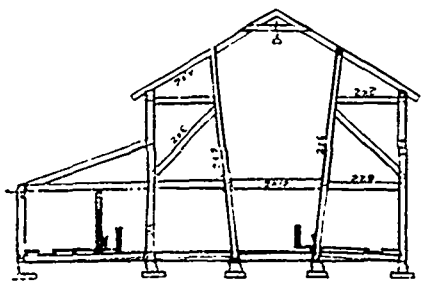

Fig. 2.

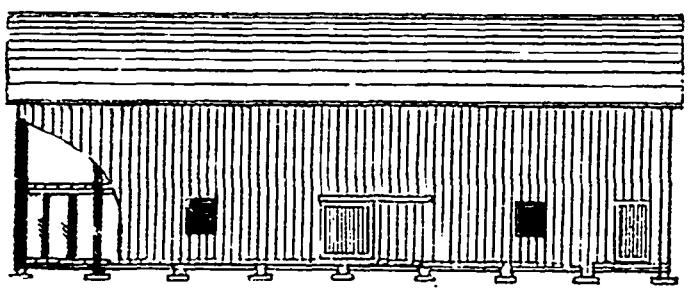

Fig. 3

OUR ENGRAVINGS.

Illustrations of Stacks, thatching, &c.
Mr Payne's Barn.

EXPERIMENTS AT THE AGRICULTURAL COLLEGE, GUELPH, ONT.

There is one thing very taking in all that comes from the pen of Professor Brown; no one can doubt for a moment that everything he states is honestly and fully stated. We may differ from him as to the conditions necessary to the full elucidation of a question; but as to his determination to arrive as nearly as possible at a true solution, there cannot be two opinions. Hence one always welcomes the arrival of the advance reports of the experiments carried on at Guelph—one is sure to learn something from them—and the report just received, though for some reason or other rather after its time, is particularly interesting, as it contains a full statement of the effects of ensilaging corn, from the first pitting of it to the comparative products of the ensilage and its rival-food, roots, in milk and butter. Mr. Brown did not build a new silo: he made use of an old root-cellar, filled it with chaffed corn, which he spread and packed in as solid as possible, covering it with two-inch planed boards, overlapped by half thicknesses, and loaded with 200 lbs. of stone to every superficial square foot. The ensilage heated as usual; a strong brewery smell continued during the fermentation, and at all times when the stuff was broken up. On the 1st November the silo was opened, when about one foot all round the walls was found to be rotten—owing to the plumbing and smoothing of the walls having been neglected—inside the decayed part the fodder was as fresh as when first ensiled. Four common cows, of as nearly equal qualities as possible, were chosen to test the value of the fodder. The experiment lasted sixty days, and as far as producing well defined results goes, was eminently satisfactory. Three cows received ensilage and three received swedes, and *vice versa*. At first, the cows ate the corn greedily, taking 50 lbs. a day for the first week; then they tired of it, and fell off in condition, giving a smaller quantity of milk, to remedy which each cow received, in addition to the fodder, 8 lbs. of hay and 2½ lbs. of bran. With this ration the cows consumed on an average only 6 lbs. a day of the ensilage, and did not seem to relish it much. Rather curious that they should so soon tire of it; as when the other cattle had a taste of it given them, they seemed to relish it highly.

And now comes the milk record of the six cows:

—	Milk per cow per day.	Sp. gravity of milk.	Per cent. of cream.
	Lbs.	Lbs.	Lbs.
From ensilage	28	108	12¼
From turnips	33	107	12

No great difference, truly; still about 18 per cent. more milk from swedes, hay, and bran, than from ensilage, hay, and bran.

But it is when we turn to the quantity and quality of the butter from the ensilage fed cows that we find the great inferiority of their produce:

BUTTER FROM 100 LBS OF CREAM.

From ensilage ..... 35 lbs.
From swedes ..... 46 lbs.

Or 31 per cent. more from the old system than from the new! And more:

"I look upon this butter result as the most important of any obtained throughout the experiment. First, it is another proof, added to many others, that the percentage, or volume, of cream is no criterion of its buttery properties—that the bulk of cream does not indicate how much butter it will give; in this example both kinds of milk registered twelve per cent. of cream, and yet the one turned out thirty per cent. more butter than the other—actually about *one-third* more. It is also additional evidence that food affects the quality as much, if not more than the quantity of milk. How the food affected, for and against, I cannot tell, nor possibly can anybody else, but it unquestionably did so in these examples."

"But not only were quantity and quality of milk materially influenced, the *colour* of the butter was in every churning highly different, needing no practised eye to say so, that from ensilaged corn was of a pale yellow tinge and greasy appearance, as against the very decided and well known healthy-looking yellowness of the other. During my visit to the Eastern and Western Dairymen's Associations this year, where samples of the butter were shown, very many good judges were surprised at the difference in colour."

Rice-meal in cattle-feeding—Messrs. Ross Hall and Co, of the rice-mills, Montreal, sent half a ton of mixed grain to the Agricultural College for trial, it consisted of

4 parts rice
3 " oats
1 " pease
} all ground.

Four pairs of steers, averaging 21 months old, were put up to fat with the following effect:

DAILY CONSUMPTION OF FOOD.

Hay.	Roots.	Bran.	Rice.	Daily increase.
lbs. 9¼	lbs. 35	lbs. 3¼	lbs. 6	lbs. 1 81

By which we see that a store-steer, weighing 908 lbs., gained one pound of live-weight from the consumption of 5 lbs. hay, 19 lbs. roots, 2 lbs bran, and 3½ lbs. rice meal. At market rates, this pound of live weight costs 12 cents; hay, $10 a ton; roots, 9 cts. a bushel of 60 lbs.; bran, $13 a ton; and the rice-meal, $27.50, at Montreal.

Of barley-meal 11¼ lbs. were consumed by a steer per day, in addition to roots, hay, and bran; the barley being put at one cent a pound, and in this experiment the addition of one pound live-weight to the steer cost 14cts! Why on earth barley-meal should be worth only $20.00 a ton, and rice $27.50 for feeding purposes, I do not see.

DAILY CONSUMPTION OF FOOD.

Hay	Roots.	Bran	Barley-meal.	Daily increase.
lbs. 12	lbs. 46	lbs. 5	lbs. 11¼	lbs. 2 15

Corn-meal, on the other hand, showed the following:

DAILY CONSUMPTION OF FOOD.

Hay.	Roots.	Bran.	Corn-meal.	Daily increase.
lbs. 9¼	lbs 34	lbs. 3¼	lbs. 9¼	lbs. 2.31

By which it appears that the average steer, weighing 970 lbs., consumed daily the above quantities of food, and

made a daily increase of 2 31 lbs. live weight, which shows that it took 4⅛ lbs. hay, 15 lbs of roots, 1¼ lbs. bran, and 4⅛ lbs. corn-meal, to make one additional pound of live weight, at a cost of 10 cents per pound, with corn at 1¼ cts a pound or $25 a ton.

With pea-meal the following average results were obtained:

DAILY CONSUMPTION OF FOOD.

Hay.	Roots.	Bran.	Pea-meal.	Daily increase.
lbs	lbs.	lbs	lbs	lbs.
9¼	36	3¼	8¼	2 28

Thus, by the use of pea-meal, the average steer made one pound of live-weight from 4⅛ lbs. hay, 16 lbs. roots, 1¼ bran, and 3⅝ lbs. meal, which, reckoning pea-meal at 1¼ cents a pound, cost 10 cents per pound.

And the result of these experiments is, that pea-meal is the most profitable of all the grain and pulse crops. It is a pity, I think, that in none of the trials was the effect of crushed linseed tested; mixed with the pea-meal it would, judging from my own experience, beat all the others into fits.

Swedes, sugar-beets, mangels.—The comparative value of these roots stands as follows—chemically considered, of course:

Sugar-beets	.87
Mangels	.63
Swedes	.48

I have no experience in the use of sugar-beets, so I cannot speak personally of their qualities; but mangels and swedes I have grown largely, and my verdict as a practical man is: up to the time when swedes begin to shoot out in spring, they are the superior food; but in May, June, and July, mangels are invaluable—far more nourishing than tares, or other green meat. My old farm-tutor, William Rigden, the celebrated Southdown ram breeder, would pay any price for mangels for his show-sheep, in summer, when his farm was cram-full of all sorts of food. The only instance of the successful use of mangels in the early part of the feeding season I ever met with, was when Parry, then farm steward to Mr. Webb, of Calcot, near Reading, Eng., was preparing two fine Devons for the Smithfield Club Show of 1856. To my astonishment, I found him stripping young mangels for them in October, in preference to turnips or swedes, of which there was an abundance, and very well the steers did upon them, as was proved by their being *highly commended* by the judges at the exhibition.

Now Mr. Brown's trial of these roots stands thus:

—	Hay.	Bran	Grain	Roots	Average weight of animals.	Daily increase per head.
	lbs.	lbs	lbs	lbs	lbs.	lbs
Sugar Beet...	10¾	3	6¼	52	1059	2 31 2 70
Mangels.....	11¼	3	6¼	55	1063	2 38
Turnips	12	3	6¼	52	1061	2 36
Means.....	11¼	3	6¼	55	1061	2 33

The double set of figures, under the head of daily increase per head, is in allusion to the loss of weight of one of the cattle from illness; but a great many trials of this sort are necessary before the question can be satisfactorily settled.

The next table shows the result of nearly 5,000 tests of dairy-cattle. Mr Brown does not believe in "the general purpose-cow", and he has had no experience of Jerseys or Holsteins. I sincerely hope he will have an opportunity of trying them this season, and the Guernseys as well. I hope to begin an experiment myself, shortly, of a Guernsey bull with the cow of the Eastern Townships, if I can find the right sort of animal. An average cow, for dairy purposes, should give 20 lbs. of milk a day during 200 days every year; 8 lbs. of cream for every 100 lbs. of milk; 45 lbs. of butter from every 100 lbs. of cream, and fully 10 lbs. of cheese for every 100 lbs. milk. The conclusions Mr. Brown arrives at are, that in Ontario experimental-farm experience, the short-horn (pure) is an average milker, and that the grade of this breed approaches the nearest of any others to what is called a "general purpose-cow", but for dairy purposes, the native or common cow of Ontario (not Canada properly, because Quebec in particular stands distinct in her class of dairy-cows) takes a high place, and along with the short-horn grade, is peculiarly the dairy-cow of the country.

RESULT OF NEARLY 5,000 TESTS ON BREEDS OF CATTLE FOR THE DAIRY AND CREAMERY.

Breed.	Average weight of cow.	Days of milking season	Milk, per season	Sp. gravity of milk	Per cent. of cream	Cream by weight	Butter from		Cheese from milk	Value per season of				
							Milk.	Cream.		Milk	Cream	Butter	Cheese	
	lbs.	Days	lbs.			lbs.	lbs.	lbs.	lbs	$	$	$	$	
Shorthorn.....	1570	170	3250	97	10 3	8 3	44	.....	12	19	11	22	30	42
Shorthorn Grade.....	1450	220	3960	106	8 4	6	24	46	11	30	10	18	26	27
Aberdeen Polled.....	1300	170	2380	111	6	6 4	33	40	11	18	7 4	16	.....	.....
Aberdeen Poll Grade	1150	190	3040	109	6 4	6 4	.....	.....	11 4	23	9 3	.....	26	.....
Hereford.....	1310	180	2310	97	5 4	6	2	504	11 4	17	8	.....	26	.....
Hereford Grade	1100	200	3570	106	7 3	6 4	24	40	7	27	11	.....	26	.....
Devon.....	1050	200	2800	113	7	6	33	.....	16 4	21	11 3	.....	45	.....
Galloway.....	1250	190	2470	105	6 4	6	.....	.....	9 4	18 4	7 4	.....	23	.....
Ayrshire.....	1000	210	5250	101	6 4	6	34	.....	11 4	39	21	35	58	.....
Ayrshire Grade.....	1050	220	4400	102	6	6	.....	.....	.....	33	11	.....	.....	.....
Jersey.....	740	200	2500	103	8	6	.....	.....	.....	19	57	99	.....	54
Canadian.....	950	240	4800	95	6	6	.....	.....	11 3	36	19 4	.....	.....	.....

Arthur R. Jenner Fust.

VETERINARY DEPARTMENT.

Under the management of D. McEachran F. R. C. V. S.

(*Address P. O Box 1265, Montreal.*)

FOOT AND MOUTH DISEASE.

We take the liberty of transferring from the Portland Daily Press a full report of the Foot and Mouth Disease now prevailing in Maine.

Having visited the infected district, on behalf of the owner of the imported animals, we can confirm the report. The extreme contagiousness of the disease is fully illustrated in this instance, and will explain the necessity for the rigid quarantine system enforced by us here. In the mean time, cattle shipments from Portland are stopped. The disease is now spreading in the vicinity of Portland, and will require energetic efforts to arrest it. (Mr McEachran is now in Kansas, investigating, at the request of the U. S. Government, the true state of the cattle supposed to be suffering under this dire malady.)

A. R. J. F.

April 1st 1884.

The Scourge Obtains a Foothold in the Vicinity of Portland.— Interviews with all the parties interested.— A Complete Diagnosis of the Disease, and the Precautions taken by Dr. Bailey.

Saturday, the PRESS hearing that the Foot and Mouth disease had broken out among the herds of cattle owned by James L. Peirce and James L. West of Falmouth, Samuel Rolfe of Deering, and Mr Shattuck, Superintendent of the Quarantine Ground, made a careful and as far as possible, thorough examination into the matter. As only a short time ago the same rumor prevailed, and Dr. Thayer, the United States inspector, had pronounced the disease other than the scourge now prevalent abroad, the PRESS thought probable that the rumor was only an old story revived. Such, however, did not prove to be the case, and the result of the reporter's investigations will be found below:

COLLECTOR DOW.

Collector Dow said: the steamer Ontario, of Dominion Line, arrived at this port Feb. 2nd, with a herd of 28 Hereford cattle. The government regulations are that the cattle shall be unloaded from the ship under the charge of the United States veterinary inspector, and disposed of as he directs. Dr Thayer, one of the United States cattle commissioners, and as eminent an authority as any in the country, came to Portland and examined the herd before they were removed from the vessel. Dr Thayer reported to Collector Dow that the cattle were free from contagious disease, stating he had especially examined them for the foot and mouth disease, now so prevalent in England.

Under Dr Thayer's direction the cattle were driven to the quarantine at Deering. It is not the intention that cattle shall be driven to the quarantine along the road, but Dr Thayer thought it absolutely safe to do so in face of the careful inspection to which they had been subjected. The disease developes in from three to six days after exposure, and as these cattle had been fourteen days on the steamer without developing any symptoms, the doctor deemed them entirely free from disease, and considered no danger could arise from driving them to the quarantine.

A few days after arrival at quarantine, Mr. Shattuck, the superintendent, reported to Mr. Dow symptoms of foot and mouth disease among the cattle. Dr. Thayer was at once telegraphed for, came to the city, examined, in the collector's presence at quarantine, every animal presented to him supposed to be suffering from the disease, and decided there were no symptoms apparent. Afterwards, Mr. Dow heard that Dr. Thayer then came to the city, pronounced the cattle free from the disease and authorized publication to that effect, and the statement was made in the PRESS. About the middle of last week, Mr. Shattuck expressed fears of the foot and mouth disease, and upon Thursday last, Collector Dow was notified that a yoke of oxen which followed the herd of Herefords (on the latter's way from Portland to the quarantine grounds) had been taken sick with the foot and mouth disease and that some other cattle, which had come in contact with them, were also down with the disease. Mr. Dow went at once to the quarantine and learned from the superintendent there that the imported herd was very much improved in health, only one or two animals, at that time, showing any symptoms of the sickness, and it has since been reported that these are better. Dr. Thayer was at once telegraphed, came to Portland Saturday noon, and in connection with Dr. G. H. Bailey, the celebrated veterinary surgeon of Portland, made careful examination of the cattle on the farm of Mr. Samuel Rolfe, which cattle were supposed to have taken the disease from the imported Herefords, and they pronounced the cattle clearly infected with foot and mouth disease. They also inspected cattle of Mr West and Mr. Pierce, that were sick, and they were also pronounced suffering from the same trouble The collector said the cases thus far were of a mild type. The disease is highly contagious. Little sores appear in the mouth, and between the toes. There is a great deal of fever. The disease developes in from three to six or eight days, and while the beasts are sick they should be carefully isolated in buildings by themselves. No hay, other than what they eat, should be left in the building with them, and their droppings should be kept apart from the other manure, and should be carefully disinfected: of course no farmer of principle would ever dispose of milk which he knew came from a sick animal. The disease is rarely fatal. If a farmer notices the disease in any of his cattle he should isolate the sick ones at once and immediately notify the town authorities.

It was introduced into the United States in 1841, from Canada, where it had been carried by diseased cattle sent from England. Apnthous fever is an eruptive, highly contagious and infectious disease, affecting the mucous membrane, and the inter-digital space of such animals, as cattle, sheep, goats and pigs, and in some instances it has been transmitted to people, horses, dogs and poultry. We know no more of the causes which develope this malady, than we do of those of varioloid, or pleuropneumonia Every cause that tends to diminish health has been invoked; but no sooner is it investigated than it is found to be impotent to deal with the disease. The acute symptoms of this disease are characterized by an eruption of vesicles, or blisters, in the mouth, and on the internal surface of the lips, and on parts of the body where the skin is thin, as on the udder and between the claws. It passes through different phases, reckoned as fever, eruption ulceration, and desiccation. There is always an increase of temperature, the mouth being hot and inflamed, the membrane being covered with viscid mucous, which flows in stringy masses from the lips. There is grinding of the teeth, and a smacking or clicking noise, pathuomonic of the disease. The lesions of the feet are preceded by pain, manifested by restlessness, frequent lifting and shaking of the fore and hind feet, and is rapidly followed by development of vesicæ, generally between the digits, and often extending almost all round the coronet. There is considerable lameness, and the animal prefers to maintain a recumbent position. In the severer forms, too, abortion occurs, and in all cases the animals are very much reduced in condition; 10 per cent. being given as the average loss by death, when the disease is most severe. One attack of this disorder does not secure immunity from another, and from cattle who are especially affected by it, and are the most important bearers of contagion, it will spread to the human subject, and the horse. As a rule, however, the fever runs its course, without much constitutional disturbance in from eight to fifteen days, and its termination is generally favorable under good conditions of hygiene and careful nursing, though convalescence is generally slow. The contagion is both "fixed" and "volatile," according to the opinions of the best authorities, but its volatility is feeble, and it exists in its most

concentrated form in the lymph, or serum of the vesicles, and in the saliva, but this is not the exclusive vehicle, the milk, as well as the blood, containing it. It is also present in the excretions. Four weeks after the disappearance of the disease the dung of infected animals has caused an outbreak in a team of oxen, employed in carrying it away from the farm and ploughing it into the ground, and these oxen contaminated other creatures. Zundel has known the virus to be preserved a long time in the forage, and in the walls, or in the air confined in the stables. The period of incubation in this disease is brief, usually from three to be as long as ten or twelve days. The mortality from the disease is the least in the case of adults, and the most severe in what is designated the "catarrhal" or "typhoid" form, and during the prevalence of the malady in Switzerland in 1839, more than 2000 cattle perished in the Alpine pastures of Freiburg. When it is considered how rapidly animals lose condition, especially fat stock, what losses occur when it appears among milch cows, or among oxen used for draught, and the embarassment it may from its presence occasion to agriculture, and the cattle and milk trade, as well as the expense of curative measures; it cannot be doubted for a moment thas this is a great scourge, even under the most favorable circumstances. The money loss, (direct) from the malady in England has already been estimated at $75,000,000. When the disease appears, isolation and disinfection must be looked upon as the principal measures to be enforced. The healthy animals must be separated from the diseased, and not allowed to travel the same roads, nor to drink from the same watering places. The animals should be kept in clean, well ventilated stables, and fed on soft, easily digested food, with free access to cold water, and while it is unanimously agreed by the principal veterinary authorities that the flesh of affected animals is not injurious as food, it is not so with regard to the milk, although all authorities admit the harmlessness of the milk, when it is boiled. It is hoped that the present measures promoted, adopted, and rigidly enforced, by the selectmen and cattle-commissioner, will keep the disease within its present limits, and if any other cases should occur, they should be at once reported to the proper authorities. If this is done, I have every confidence in its early suppression, and permanent removal from our State The first and most important indication of sanitary science, is the prevention of contagious diseases, and the next is their suppression when they have appeared. These indications should, as I have already insisted upon, be the subject of legislative measures which must be carried out by skilled agents, whose efforts should be seconded by the hearty cooperation of those for whose benefit a veterinary sanitary service is maintained. (Dr McEachran has returned.)

EARLY GRAPES. -The Gardeners' Monthly gives a valuable communication from T. V. Munson of Dennison, Texas, giving with precision the periods at which most of the well known early grapes ripen in that locality. *The Champion is three to five days earlier than any other*, its vigorous growth and productiveness more than counterbalancing its poor quality, and it sells well. It may be better there than at the North Moore's Early is three or four days later, larger than Concord, with less rot, and a better shipper. It has great vigor and productiveness. Lady ripens with Moore's Early, is excellent in quality, with no rot, vine hardy, a slow grower. Prentiss is nearly as early, of fine quality, rots some, vine moderately healthy and a fair grower. Telegraph ripens just before Hartford, and is much preferred to it. Perkins, of little value at the North, is esteemed in Texas for its great vigor and productiveness, freedom from rot, and fair quality, selling as well as the Delaware. Early Victor, rather small, of fine quality, vigorous and productive, ripens with Perkins. Eumelan, Delaware and Walter, are about the same as at the East. Brighton is highly commended for its excellent quality and vigor, ripening with or just before Delaware, but "rots to destruction." Lindley is preferred to others of Rogers' hybrids. —*Country Gentleman.*
