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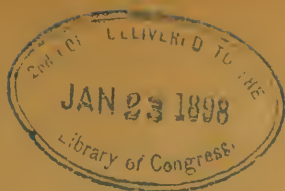
*Thirty Years
Among Cows*

...BY...

N. B. WHITE,

OCONOMOWOC, WISCONSIN.

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DEDICATED TO THOSE WHO CAN
BOTH THINK AND ~~READ~~.

ironic



PRINCESS VERONA, 95536 A. J. C. C.; 42 lbs. Milk per day, 19 lbs. Butter in a Week.
Owned by N. B. White, Oconomowoc, Wis.

Thirty Years....

....Among Cows

—BY—

N. B. WHITE *Am*

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CHAPTER I.

TO THE YOUNG.

THESE few pages are written by a busy man for busy people to read, and ten words will never be used when five will do as well. The words on the title page, "Among Cows," do not, in this case, refer to a man who hires help to do the work at the barn and visits the stables occasionally, but to one who does a part of the work himself.

The writer lived away back in the "dark ages," although the term is not here used in the sense in which it is sometimes used in history. Here "dark ages" refers to the time when all the light we had in the evening was from a tallow candle and all the lantern we had was made by punching holes through tin, and all the light we had at the barn was made by the few rays of light which managed to escape through those holes. In going to and from the barn, on a windy night, the lantern must be kept under a coat. A few of those old relics are still in existence and may be quite a curiosity to the young.

The old barn, on the farm where my boyhood was spent, was built about the year 1800. The timbers were of immense size and many in number, all framed and put together by a master mechanic of those days, who understood the old "scribe rule." Under this rule there

were no two braces in the building alike, but each one was made for a particular place, and marked after it had been fitted to its post and beam.

The barn was built on a hill-side, sloping to the north, and the barn-yard was on the south side of the barn, but fully exposed to the wintry blasts from the west. The stable was on the west side, boarded with a single thickness of lumber, and for many years was left with open cracks. The floor was made of a single thickness of planks and was nearly level, without platform or drop, and bedding of any kind was never used.

As might be supposed, the sides of the cows were pretty well covered with manure before spring. On other farms cattle were kept in the same way and at that time the idea of keeping the cattle clean, when fastened in stables for the winter, had never entered the head of any man in that part of the country.

The cows were dry during the colder part of the winter. Most of the calves were dropped during March and April, and the man who had skill enough to milk those cows without having the milk taste "barny" was called a very clean and careful milker.

Early in May the cattle were turned to pasture. After they had been out a few days it was the custom to cut off an inch from the end of the tails, so as to prevent their having hollow tail or what is sometimes called "wolf in the tail." This was done early in the morning, and at noon, those that were still bleeding, were driven to the barn and the tender hearted owner bound up their bleeding "caudal appendages" with puff ball.

Physicians at that age were as blood-thirsty as the cow-doctors. In the spring of 1851 my grandfather was very sick. One Sunday afternoon, in a pouring rain, the family doctor appeared and took away blood enough to cure him, but for some reason he only lived eight hours afterwards. The doctor was, perhaps, as much surprised as the one who attended George Washington during his last sickness, who states that he gave him immense quantities of powerful drugs and took away so many ounces of blood "but still he grew worse!" Glancing back, in this way, for a hundred years, we see how the medical experts of one age become quacks in the eyes of medical men of succeeding ages.

If the "cow doctor" of olden time is at the present time the object of ridicule, so is the physician who was in practice in the same neighborhood. We wonder at the foolishness of the past. Future generations may wonder at the foolishness of the present age.

Thus, briefly, have I given the young a glimpse at the "dark ages." Now, just think how many thousand years the world has been in existence, and more progress has been made in the physical world during the present century than in all the centuries before.

In the beginning of this century there were no railroads, no steamboats, no telegraphs, no telephones, and up to the middle of the century scarcely any farm machinery. There were no mowing machines, no reapers, no threshing machines; and I well remember when the first corn cultivator was brought into my native town, away back in New England, about the year 1854. At that time there were threshing machines; but the

grain was cleaned in a fanning mill run by hand, for skill had not then shown us how to make a machine that could thresh and clean the grain at one operation.

Why this wonderful progress the last hundred years? Because the thinking men have taken hold of matters pertaining to the physical world. Formerly, if a man could think readily, he would devote his time to literature, the study of theology, medicine, or he would engage in mercantile business. On the other hand, if a man excelled in physical strength, he would learn a trade or work on a farm. He must do the work; the professional man must do the thinking. Once upon a time a laboring man began to think. As he toiled from early morn till late at night, he thought of many ways to lighten his burden. The result was, the spinning jenny, the cotton gin, the horse rake, the cultivator, the mowing machine, the threshing machine, the self-binding grain harvester, and the whole line of improved machinery.

In literature and oratory the world has advanced but little since the days of the Roman Empire. The powerful minds have found new fields for intellectual effort in shaping things connected with the physical world; and now some of the best minds are at work upon problems connected with agriculture. Let no young man who can think, start for the city to study for a profession because there is no chance to use his mental powers on the farm. Read the life of Elihu Burritt, "the learned blacksmith," and see how a man can toil and think at the same time. The value of a book does not depend upon the number of pages. If by reading

this little book, so small and uninviting in appearance, you learn to use your hands and brain at the same time, it will be worth more to you than many a large, nicely bound volume.

The writer of this has no special talent for investigating or studying out new things except the inherited gift of a "mathematical mind." Ordinarily a man may be discouraged if he does not solve a problem in mathematics in two hours, but a man with a strong love for mathematics, at the end of two years, has no idea of giving up the subject as incomprehensible. No boy is fit to become a farmer till he has thoroughly mastered every branch of mathematics, including geometry. By studying geometry, his mind learns to grasp facts and from the facts learns to draw conclusions. It is said that Lincoln, when engaged in a case requiring close reasoning, was accustomed to spend hours over his geometry.

In this book are six things entirely new: The way to prevent milk fever, abortion, scours in calves, and the way to keep ensilage from spoiling while feeding during the warm winters, the way to keep cows clean in the stable, and the way to prevent chinch bugs going from barley fields into the corn. Some or all these conclusions may be wrong but the manner of investigating and reasoning are commended to the attention of all, who do any hard thinking, both old and young.

CHAPTER II.

MILK FEVER.

This subject is taken up first as more important than anything else discussed in this book. The disease has baffled the skill of those who have had the most experience. A veterinarian recently told me he would rather never have another case, although he cured the first three cases he ever had, but the next three cows he lost and the greater part of the cows he has treated have died; and it is usually so fatal that it is a very bad disease upon which a veterinarian can build a reputation.

For years it has raged, taking away the best cows in the herd for its victims, and how little have we learned about preventing or curing the disease? Could a census be taken for the last twenty years, we would probably find that the losses of 1896 were equal to that of any other year in the twenty. In 1896 I know that six cows died in one school district, and if the average be only one in a school district throughout the country, yet the aggregate loss would amount to a large sum. In that district milk fever killed two cows out of a herd of fifteen and the others aborted. There is something wrong, for in my native town, during twenty-five years, I never heard of a single case of milk fever or abortion.

Experience is said to be the best teacher, but in

my case the tuition was rather high. It cost me \$700 to learn what I know about milk fever. In losing that amount I was following the advice of those who pretended to know how to avoid its ravages.

In my boyhood I often heard that rye meal was the best feed for cows before calving. "There will never be any trouble if you give them rye meal," was a common expression. In the East they raise but little grain and feed rather sparingly. Used in that way it is safe, but fed in western style there is nothing more dangerous. In following the advice heard so long ago, I had my first case of milk fever. Cow and calf were in a box stall, when to my surprise the cow dropped as suddenly as if she had been shot. This was late in the afternoon, and the cow lay till the next morning in great agony. We sent for a cow doctor and in four days he had her on her feet again. She did not get up like an invalid, but a rabbit never jumped up in quicker time. The shock was so great that as a cow she was ruined, and, after keeping her five months, she was sold for beef.

Every paper devoted to agriculture had an article at least once a month on milk fever. These articles I eagerly read, and from them I learned how to prevent losses from that disease. Cut down the feed and all will be well! I cut down the feed at calving time and another difficulty presented itself. The after-birth would not come away and it was fastened so tightly to the "buttons" that the cow partially inverted the uterus in endeavoring to expel the after-birth. Night after night have I watched cows in that condition, using alum

to produce contraction, and these cows were generally ruined for they refused to breed again. Twice in succession had I been fooled by following the advice of some one who knew very little, and a little knowledge is said to be a dangerous thing. This method of preventing milk fever is called "starvation" and if followed a great while it will lead a man very near starvation himself.

Thirdly, but not lastly, I read a letter in the Country Gentleman, written by B. F. Johnson, of Champaign, Illinois, stating that one-third of the highly-fed cows in that vicinity died with milk fever and how it could be easily avoided by feeding a few potatoes to cows at the time of danger. That seemed to me to be the most sensible advice I had ever heard. I fed my cows three or four quarts of potatoes per day just to keep the bowels loose, and I lost three cows in three months! Behold the glorious results of following the advice of the wise!

Fourthly. My friend, H. S. Weeks, lived near me and was a frequent visitor at my farm. He was probably the most successful dairyman that ever lived in Waukesha county. I esteemed him highly as a man of integrity, and for his skill in handling his cows and his milk in such a way that the gross earnings of his cows was in the vicinity of \$90 per cow annually. To him I told my story of misfortunes, and he said he had lost many cows in the same way, and got some medicine in New York that made milk fever impossible. I procured the medicine, but my cows died full of it!

Fifthly. A veterinarian suggested that he could

give me some medicine to give a cow for a few days and she would go through all right. The next cow seemed to be doing well for twenty-four hours after she dropped her calf, when I saw something was wrong and according to my notion something must be done.

Sixthly. I again found myself following the advice published in agricultural papers for years and the greatest humbug of all: "In case of danger give a pound of Epsom salts." The physic worked and according to all rules the danger was passed. The following day she was turned to pasture with the other cows, but I noticed she was stiff like a foundered horse. At noon she was down and unable to rise. The following morning she was dead. Thus endeth the reading of the story of the calamities that came upon a traveler by asking those who were unfamiliar with the country, to point out the way. I was like a stranger in a strange land—like a man lost on a boundless prairie without a sun, without a star, without a compass! To stop or go forward was equally perilous!

To many this will seem like making a great noise for nothing. "I never had any trouble of the kind," is a common expression. Cows that are inclined to make 150 pounds butter in a year will never have the milk fever, while one inclined to make 300 pounds, is often a victim. Buying a higher class of cows brought to me new difficulties, for they were subject to diseases that were unknown among common cows. Domesticate the buffalo and milk fever would never occur, for their capacity for giving milk is of a very low order. For the same reason a heifer is not troubled with the disease.

These few pages, then, are of especial interest to those who keep the higher class of dairy cows and to those who are not satisfied with one that can earn only \$30 in a year, out of which must be deducted the expense of keeping for fifty-two weeks before any profit is realized. Instead of giving up the higher class of cows, we wish to learn how to handle them so that there will be no loss on account of their extra dairy qualities. It will be seen from the experiments thus far conducted that we have not found the right way to feed and care for cows of high breeding. Shall we give up, or try something new?

While cows, worth from \$40 to \$50 each, were dying I learned nothing, because I did little thinking. Finally, I lost a cow that \$300 would not have bought. Then the thinking began in earnest. I dissected her to find out what the trouble was and I found impaction in the manifolds. So closely was the green grass packed and dried up, removal by the use of any drugs would have been impossible. This was May grass, naturally so green and juicy that it acts usually like a cathartic. A farmer would never blame a veterinarian for failing to cure milk fever could he see the cause of the trouble. I never lost but one cow after beginning to think and study the whole subject as one would study a difficult problem in mathematics. The problem for solution was this: "Can anything be found in the whole universe which will not pack in the manifolds?" Water will not pack, for the particles move freely among themselves. Water will not answer the purpose, for the water may be separated from the dry matter and

impaction may occur when there is plenty of water in the stomach. Salts have been tried and temporarily accomplished the desired object, but it is a general rule that the use of cathartics is followed by constipation and I found this old remedy not only useless but dangerous.

Cannot something be found that is not in liquid form? A man who raised flax once told me that a bin must be tight enough to hold water or the flax would run out. That was what I wanted in those manifolds, a plenty of oily, slippery flax seed and the impaction and milk fever will be impossible!

Now for the experiment to test the nature of flax seed. I took a tunnel with an outlet one-half inch in diameter, and holding my finger at the opening till the tunnel was full of flax seed, I found all the flax would run out in ten seconds. Then I filed the same tunnel with fine corn meal and a spoonful ran out and then it clogged. A little shaking started it again, but only to clog a second time. Now theoretically and experimentally, it appeared that flax might be a very powerful agent in keeping the passage open through the stomach and bowels. With these conditions, I will defy the dread disease.

The eight weeks after the loss of my three-hundred-dollar cow, were spent in solid study and then I was ready for business. It was now the latter part of July and one of the largest milkers in the herd was due to calve soon. It was a period of unusual heat, the thermometer standing near 90° day and night. I built a pen outside the barn for this cow and put her in it

nights, and at night, several hours after she had come from the pasture, I gave her two quarts of whole oats, half pint of ground flax seed and half pint of whole flax seed. In the morning she had the same with a little salt added. She dropped her calf and was chewing her cud every day, indicating perfect health. In a week she was giving twenty-two quarts of milk a day, which was her usual flow.

For four years, in a herd of fifteen cows, the same thing has been repeated with perfect success except in one case. Thinking milk fever a thing of the past, I began to be a little careless and took no precaution whatever when cows were running in good pasture. One morning I found a genuine case of milk fever. Taken in the first stages, the cow was soon cured and after a few days was giving eighteen quarts of milk per day—the same as she had given the year before, showing that an attack of milk fever, if soon cured, does not necessarily injure the cow for that season.

With some men everything new is a humbug or they have known about it for years if they think it will prove to be valuable. I have read agricultural papers for years and up to this date—Jan. 27, 1897—I have never seen anything about using whole flax seed to prevent milk fever. If other farmers can make as good use of it as I have, this will revolutionize the milk fever business. In feeding flax whole, probably very little of it is masticated or even cracked and it may be indigestible with the hull unbroken. This will not in any way interfere with its action, for the action desired is mechanical rather than medicinal. It is a principle in

mechanics that friction always retards and sometimes stops motion. Now flax is so smooth and oily that the kernels can glide by each other without much friction and is admirably adapted to forcing a passago, when other kinds of feed will clog.

Whenever a cow refuses to eat oats mixed with flax put the flax into a bottle of warm water and give the same as a bottle of medicine, the flax will go down as easily as the water. This should be continued for two days after calving. Sometimes two men have a struggle to give a cow anything from a bottle. This is unnecessary. One man can do it better than two. Stand on the right side of the cow. With the left hand reach over the nose and insert the fingers in the farther side of her mouth. Raise her mouth a little higher than the backbone and with the right hand insert the bottle which should have a long neck, reaching as far down as possible.

After a trial of four years, I have concluded to make this public, believing it will be of service to others and all who read this are requested to write to the author once or twice a year, telling how it works with them and whether there is any better system. With me it has been pretty well tested. Never more thoroughly than last July. For two months one of my cows had been dry and had run in a neighbor's pasture where there was excellent feed. Knowing it was nearly time for her to calve, I visited the pasture one afternoon, and found her quite fleshy and her bag full and milk streaming from all her teats. I immediately drove her home, and you say you know the rest, "and gave her oats and

flax seed." I did nothing of the kind. Nothing could be more dangerous. She was full of grass, and oats given at that time would have likely caused bloat and death. When the oats become moist, they swell and overcrowd the stomach, already full enough. I waited five hours, then gave her the oats and flax. In the morning there was a calf in the pen, and cow and calf were in first-rate condition.

I would not rely upon flax alone in all cases. Four years is too short a time to prove that it is sufficient in all cases that may ever occur. Let others continue these experiments for years to come, and we shall then know whether what has proved to be true with me in a few cases, is true universally. What can be used in addition to make the case doubly sure? A few years since, a farmer found one of his cows in the woods down with the milk fever. He steeped thoroughwort, or bone-set, as it is sometimes called, and gave her the tea. He continued this for a few days and he found his sick cow out with the rest of the herd. Now, if there are virtues enough in this plant to cure milk fever, why may it not be of some account in preventing it? I take five or six stalks after it is dried, and steep it and pour it when boiling hot into cold water, until the whole is milk warm. A cow is usually very thirsty at calving time and might drink too much. Give her eight quarts of the mixture once in two hours, until she is satisfied.

Always milk before calving, if her bag is too full, and let her drink her milk after she calves. If you wish to take further precaution, give two spoonfuls of salt-peter every morning and a teaspoonful of copperas every

night If you wish to give any physic, cut fat salt pork into strips the size of the finger and feed a pound. Feed by holding up the cow's head and putting one piece into her mouth at a time. Pork and flax are better than liquid for they will be thoroughly mixed with the dry matter of the stomach and cannot be separated.

The plant, referred to above, grows in nearly all the marshes throughout the country. It stands 30 inches high, has a white blossom and has one peculiarity not found elsewhere in the vegetable kingdom, as far as my observation goes, the stalk is in the center of the leaf. In my boyhood this was the medicine for any biliousness or trouble with the stomach, but its use for cow medicine is new to me. There is more healing power in herbs than people now are generally willing to admit. Our old garret was full of herbs, but there would be five years at a time when a physician did not enter the house.

Whole grain is safer to feed for a few days before calving than ground. A cow should be dry for two months. High feeding is dangerous at any time, but I would feed well enough to get her bag filled with milk when it is advisable to milk the cow a little at a time, not fearing the old saying that it will make the calf poor. Wheat bran moistened with warm water is a very safe feed. Grass, when very rank, is not desirable, but any ordinary pasture will be likely to do no harm, if you do as directed the last twenty-four hours. An extra cow once dropped her calf before she had much milk in her bag, and she was a very inferior cow for the season. For

that reason, I feed a cow as well before calving as I would four weeks after.

I am aware that these views are contrary to those usually expressed in dairy papers. This explains why I have kept still till I could feel sure that the new way was safe for all. Every year cows all around me have been dying with milk fever, while I have lost none. Formerly my herd was cut to pieces with that disease, more than any other herd in the state. How can we account for the change unless there is some germ of truth in this chapter? After spending years at work upon the matter, I now, for the first time, give to the public the result of my investigations and the public will eventually either approve or condemn the new method.

CHAPTER III.

MILK FEVER—CONCLUDED.

Wishing to give all sides of the subject, we print the following, although we do not agree with the writer:

This trouble is misnamed; it ought to be milk chill. Everything about it points to extreme chill. The body, ears and horns become very cold, and where the fever comes in we could never find. There is not even a moderate relapse to warmth, unless brought about by the attendant. Seeing that this is the case, we have got some tangible hold on it, and can, in most cases, so guide matters that the patient may be helped through the ordeal, if not kept free from it altogether. The writer has had several cases of it in pure bred Short-horns, and I can safely say that our best remedy, easiest and most reliable in every way, is milking before calving, assisted by a rather spare diet. In cases where the animal has been prostrated and with careful treatment been carried through, to prevent an attack at the next calving, milking alone will not suffice. We have had cows badly prostrated the second time, after most careful attention to milking ten days before calving. The bowels, even on luxuriant grass, will become deranged as the time for parturition draws nigh, and this must be attended to. Nothing in our experience is equal to a dose of black molasses for this. And, right

here, we may say that a quart of black molasses is the finest remedy for impaction, in cases where "loss of cud" (unable to ruminate) happens to any cattle. We have had cows off their feet for hours at the second attack, even when thus treated, but always save them. The third attack, if managed in this way, was very slight.

To have such an animal in high condition would be unwise; but the animal can be in condition good enough to do her best when danger is past. For a cow in high condition at calving, being a good milker and liable to milk chill, as I wish to call it, or one that has an attack, a starvation diet for eight or ten days previous is a wise precaution, even if milked, but it is not a positive prevention. However, I would not now fear almost any kind of condition, for we have brought several through the ordeal, and made a light attack of several cases that might have proved fatal if not thus treated.

Should anyone find their cows showing a slight stagger while standing or walking, the second, third or fourth day after calving, they will have to look alive and provide a warm, comfortable place, well littered with straw. Give the animal a good dose of salts, one to one and a half pounds. Salts are quicker than molasses, but if the bowels are in their natural condition, I prefer the molasses, they do their work complete, while salts will often make a passage through the bowels and not remove a quarter of what is wanted. Blanket the animal well, neck and body; that is what is wanted; get the flat irons on the stove and iron the cow all over on the blanket; have the irons hot and iron well on both

sides of the spine (with us a post mortem showed the spine most affected). Keep at it and you will save your cow. We have done it for twenty-four hours, and very good judges would not give us a dollar for our hundred-dollar cow. The same cow has had five calves since. A celebrated Jersey breeder buries them up in the hot horse manure pile. A very good way, if one has the pile hot enough and big enough. We do not believe that anything fed previous to calving will prove a remedy further than to keep the bowels regular, and the trouble will come when the bowels are in good order. The standard prevention and remedy is to milk. —Farmer's Advocate.

The following was published in Hoard's Dairyman for curing milk fever:

The formula that was adopted, was to give one-half pound salt peter on first discovery of the fever (which is always known by drying up of the flow of milk and prostration) and in two hours, twenty-five drops of aconite; in two hours more, if not relieved, (do not try to get the cow up, but let her be quiet until she gets up herself) repeat with one-fourth pound of salt peter and then in two hours with twenty drops of aconite. Alternate the above, one-fourth pound of salt peter and 20 drops of aconite, every two hours until relieved.

A few weeks after it was published, a correspondent said he had used the remedy with success, but used less salt peter. In four weeks another correspondent tried it and it failed. Here is his story:

A CASE OF MILK FEVER.

Ed. Hoard's Dairyman:—We have just lost a valuable grade Guernsey cow with what I suppose to be milk fever. She dropped her calf about noon on Saturday. I was away from home, but my man said he milked her, and she gave a common pail two-thirds full, probably seven or eight quarts. I returned about 4:30 and found her lying down, apparently a little stupid. I gave her a strong dose of ginger and covered her with a blanket, and soon after gave about a quarter of a pound of salt peter, as recommended on page 875 by B. W. Gregory, although he says one-half pound salt peter. I did not weigh it, but presume I gave between a quarter and a half pound. I gave more ginger two hours or so later. I thought I had no aconite in the house, but found some next morning, and began giving 25-drop doses. She could not stand up in the morning and we removed her to a place where she could have more room; gave her plenty of bedding and kept her covered up. Fed another smaller dose of salt peter, and alternated with aconite. She never hardly moved and died Sunday evening. When we opened her Monday morning, I could find no indication of fever, and I am sure there was a low temperature from the first. I expected, as she had a very large full udder, to find more or less congestion, and expected to find the generative organs in an inflamed condition, but found nothing of the kind.

Now, what killed the cow? Some would say the amount of salt peter would do it, but I once heard a

farmer say he gave a cow one and one-half pounds of it for milk fever, supposing it was salts, and as he found out his mistake soon after, supposed he had killed his cow, but to his surprise, she soon began to mend and got well. My belief in this case is this: The cow giving so large a mess of milk right away after dropping her calf, I think caused a chill, and paralysis set in almost immediately.

A veterinarian of my acquaintance says he has always found the blood in the main artery along the spine congealed or thickened the moment the cow dies, and believes it occurs before death. The theory of only removing a small portion of milk at a time, for a day or two, is comparatively a new one to me, and I confess I have not been in the habit of so doing, and I would like to know if I lost my cow in consequence of taking from her udder the large mess of milk she gave?

J. D. SMITH, Delaware Co., N. Y.

ANOTHER REMEDY FOR MILK FEVER.

I started out with the idea that I could not get something for nothing, even from a bunch of my own dairy cows, and, therefore, adopted a system of feeding that I have often been charged with as being extravagant (which I admit now to be true in part), consequently, I was overtaken with numerous cases of milk fever. But I accidentally dropped onto a remedy early in my dairying experience, that has proven very efficient.

The remedy is this; To one pound of common, family dry yeast add two quarts of warm sweet milk.

When the yeast is well dissolved and still warm, give the whole mess atonce and await the result.

In the past seventeen years, I have cured fifteen cases of my own, and several for my neighbors, losing but two of my own and three or four of the neighbor's. Every care should be taken to prevent an attack of the fever, but I have found it impossible to prevent it every time. And should you meet with an attack, the remedy should be given at the earliest sign of its approach, and if proper preventives have been resorted to, relief and speedy recovery is most sure to follow. The cow should be made as comfortable as possible, being careful to keep her dry and warm; sometimes heavy blanketing is necessary, as lung fever may follow.

I have cured two or three of my own cows with the second attack, and at the next time coming in fresh prevented it entirely. Relief comes, sometimes, in six hours, but may be delayed for twelve or twenty-four, and sometimes thirty-six hours. I have had them lie the last named time, unable to raise their heads, and recover, and in two day's time be to a full flow of milk, and it could not have been told that they had been sick. —J. S. GARRETSON, Huntington Co., Ind., in Hoard's Dairyman.

These extracts may be of service to those who neglect to use the means prescribed for preventing the disease in the preceding chapter. How much easier to mix plenty of flax both whole and ground, in the feed for a few days before such a dangerous disease gets started! Is not four years a reasonable time in which to give a new remedy a fair trial?

CHAPTER IV.

IMPORTANT FACTS CONDENSED.

A few subjects we must pass over with brief mention. It is the purpose of the writer to put a cheap edition upon the market that it may be within the reach of all who would care for the experience of one who has met with heavy losses, on account of serious mistakes. Had a little book like this been put in his hands twenty years ago, the greater part of these might have been avoided. "To him that overcometh" the obstacles in his way, there is pleasure in looking back over a clear road, where others may, perhaps, travel with safety.

DRYING UP A COW.

Cows that are inclined to take on flesh will usually, of their own accord, go dry four or five months in a year, while those naturally thin in flesh will go dry but a very short time, and, in some cases, give milk continuously for years, although dropping a calf annually. Some writers in dairy papers think it better to let a cow take her own course. With those who believe a cow needs no rest, we have no warfare, suffice it to say that we believe a cow should go dry for two months before calving, because we believe that it is taxing her sufficiently to support two lives for that two months, and overtaxing her to allow her to attempt to support three

lives—her own and that of her calf dropped the previous year as well as the one unborn.

Farmers often state that they have certain cows that they can never dry up. Having never seen anything of the kind, the writer would like a chance to experiment with one of those steady milkers. On this farm we never fail to dry a cow, even if we take her from a good pasture and keep her in the barn for ten days with no food but straw and hay of inferior quality. The flow of milk is so much better for six months that it much more than compensates for the small loss while she is dry. Cutting down the feed will always accomplish what would otherwise be impossible. Whenever the cow is milked, draw the milk all out, making the intervals between milking longer, but never allowing the bag to cake or get very full.

CALVING TIME.

To make the subject complete, there will be a little repetition of directions printed in another place.

After the cow is dry, she may be run in a pasture having fair feed, without injury, until she has carried her calf eight months and twenty days; then, if an extra cow, she may need milking, and if she is very full when she comes from the pasture at night, keep her up for three hours and feed her two quarts whole oats, one-half pint ground flax seed and one-half pint whole flax seed. Give her the same in the morning before turning her out. In the pasture she should have access to salt. More flax may be given

without injury. If apprehensive of milk fever, after nine months have expired, give a spoonful of salt peter or more at night and a teaspoonful of copperas in the morning. This will make a total of a quart of flax per day with other things mentioned. With this precaution milk fever is impossible, unless exposed to cold or storms or the cow has a chance to wade in water. If you have an inferior cow, Dame Nature will take care of the cow without any help from you. This prescription is given for the benefit of those who may have a few 300-pound cows, as we say when a cow makes 300 pounds of butter in a year.

In winter, during the period the cow is dry, hay and ensilage having only a small amount of ears, may be fed with safety with the addition of four quarts of wheat bran daily. Twenty-four hours before a cow calves, you will notice a falling in on each side of the roots of the tail. That is the time to drop the ensilage, but give the same amount of flax as advised when the cow is on grass and for the same length of time, with the addition of one pound of oil meal daily, and two spoonfuls of salt.

After she drops her calf, continue the flax seed for three days, also two quarts of whole oats twice a day, a little hay, and once a day three quarts wheat bran, wet with warm water. Keep her rather hungry, which must not be understood to mean on the verge of "starvation," which we condemn in another place. For drink, give from six to eight quarts of warm water once in two hours until the cow is satisfied. For next year you can provide thoroughwort, which is far better than water.

When you have it, make a strong tea from eight or ten stalks and pour when boiling hot into six quarts of cold water, until the mixture is milk warm. This may seem to the reader as a great deal of trouble and some may even denounce the system as all "fuss and feathers." We have practiced this system with our best cows for more than four years with perfect success, and the time required does not exceed twenty minutes per day and is in reality less trouble than to bury the cow, and we were at last cornered where there was nothing left but a choice between the two as we had tried all the old methods in vain.

This language must not be construed to mean that it is unsafe to feed a cow well if that should be necessary to fill her bag before the calf is born. It is unnatural for the bag to fill soon after going dry, for that reason two months is none too long for her to be dry, and less grain will be required to bring her to her milk again.

THE PLACENTA.

A few days since, I entered a barn several miles from home and found a fancy Jersey cow, which costs more than \$100 when a year old, standing in her stall with her hind feet elevated six inches higher than the floor. To make this elevation, horse manure had been piled up and this covered with straw. What had happened? The placenta or after-birth was not easily detached from the uterus and the whole had been thrown out. A veterinarian was called and put it back, and the cow was standing with heels the highest to prevent a repetition of what had happened before.

Had it been thrown out in the middle of the night, saving the life of the cow would have been impossible. With me, an attempt to throw out the uterus makes the cow barren. For four years I have seen nothing of the kind. Using flax and oil meal seems to cause the placenta to come away within six hours in every case. Having tried this for the stated time upon fifteen cows, it makes in all sixty cases without a failure. More grain has been fed for the ten days before calving, than formerly. A cow usually carries her calf nine months and ten days, and if you know that is her habit, it is an easy matter to feed her enough the last ten days so that this difficulty will not occur once in ten years. This fact was found out accidentally and not by study or reading the experience of others. The attempt to get rid of milk fever also rid me of the other trouble as well and is what is commonly known as "killing two birds with one stone," while on account of our blundering way of doing things, we are more likely to use several stones to kill one bird. Why did not some one tell me something about the effect of different kinds of feed and save me the losses that usually follow bad management?

Now, one thing more on this subject. Many times have I found it necessary to remove the placenta with the hand. This should always be done if it does not come away within twelve hours. To do this requires experience and no man will ever have experience unless he does it the first time. Thinking it was necessary to learn something, I began ten years ago, and when I had the business well learned, I never had any of that kind of business to do except in some herd besides my own.

If farmers will follow directions they will never need to learn.

LOSS OF CUD.

In the days of the old "tin lantern" people would sometimes mistake effect for cause, and if a cow was sick and did not chew her cud, they conjectured that loss of cud was the cause of the sickness, and I have seen a cow doctor make a cud of slippery elm bark and give to his patient, and, to his great astonishment, swallow the cud he had manufactured and draw it up again. He exclaimed: "I never saw anything beat that!" At the present time, it is generally understood that the cow will take care of her own cud if we look after her general health.

MEDICINE.

Here is a short list of simple remedies for various ailments, and they should be always on hand. Most of these are used to prevent rather than to cure disease: Turpentine, phosphate of lime, sulphur, copperas, salt peter, castor oil, cholera mixture for calves, flax seed, ground flax seed, oil meal, and in winter common soil or loam from the fields.

When breaking in the fall, we take a few bushels of sods and carry into the cellar to feed to the cattle. This is practiced on no other farm in the world and it may seem necessary to give a reason. More than thirty years ago, two farmers were talking about their cows coming out of winter quarters poorer than ever

before. One said he could see no reason for it; the other expressed the opinion that it was because they had been kept away from the ground so long. That winter had been unusually long and the ground had been covered with snow for five months. Overhearing this conversation put the idea into my head that it would be easy to provide what the snow covered up, and when I came to engage in the cattle business, I provided it and the cattle are as eager for dirt as they are for salt, and each cow will eat about four quarts of each during the winter, provided she does not have access to the ground. After the snow goes off, all farmers have noticed cattle reaching under the barn-yard fence to lap the fresh soil within reach. When you ask me of what use it can be, I reply that I am unable to answer the question, but they crave it and Nature has so constituted them that they require it as much as they do salt, although they might live for years without either.

POTATOES.

Occasionally there is an immense crop of potatoes and farmers begin to feed them to get them out of the way. The effect is often injurious rather than beneficial on account of feeding to excess. A peck of raw and a peck of boiled or steamed potatoes would always be beneficial. Never have I seen oxen gain as rapidly as when feeding each ox, daily, half bushel boiled potatoes and six quarts corn and cob meal, with a little salt added. Potatoes were mashed when hot and meal mixed, and the whole fed an hour later when sufficiently cooled.

A horseman, who delighted in fat horses, found one that refused to put on flesh, no matter how many oats were fed. He told me he tried boiled potatoes with success. His uncle was once visiting at our place and he said: "You have a very nice colt, but if there is any trouble with him, he wont be big enough. Now I can tell you what will make him grow. Cut some potatoes fine with a chopping knife and mix a quart of cut potatoes with a quart of wheat bran, and when he gets older increase the feed." The colt was then six months old and was not looking extra well. He had the potatoes and bran and what good hay he needed, and he began to grow and I never saw anything grow faster. In two months there was not a finer looking colt in the town. Almost every animal upon the farm will thrive upon potatoes for a part of the feed either raw or cooked. Hens and hogs will consume a great many potatoes if cooked, and there are few farms where ten bushels cannot be fed profitably in a day, and this looks like using three hundred bushels in a month, or eighteen hundred bushels in a winter, which would be all that a large farmer will generally raise even in a good season. I prefer one bushel of boiled potatoes, mixed with one bushel of ground oats to the same amount of oats alone. Never throw away potatoes, but use them to save grain, which can be kept over to use another season.

CHAPTER V.

ABORTION.

This is a book of experience and not of science. Scientific writers have told us much about how abortion spreads through the herd by means of germs and how difficult it is to stop its ravages. Whenever a cow aborts, I assume that it is not a contagious disease in my case, but that the conditions being very nearly the same with each cow, the disease will spread through the herd unless I can do something immediately to check it. For twelve years the subject has been carefully studied and every circumstance carefully considered so that I might gain some definite knowledge of the causes of premature birth. The result of my investigations, has not been as satisfactory to myself as in the case of milk fever. We know when to expect an attack of milk fever but abortion comes as a thief in the night. At sun-down all is well, at sun-rise the farmer finds a half-matured calf. The swift messenger that did the mischief, came under cover of darkness and left no footprints behind!

To show the anxiety and feeling of uncertainty that exists about this matter, we print a letter from Geo. C. Slayton, of Vermont, written to Hoard's Dairyman:

"There is one subject I would like very much to have discussed through Hoard's Dairyman; that

is, Abortion in Cows. In this vicinity it is quite prevalent, and, as I read, it is more or less so all over our country. Now we see this thing and that advertised for this malady, but it is a disease that is new to us in this section of the country, and it is getting into and spoiling some of our best dairies. Now it seems to me, that we want to get at the cause and remove it if possible. Medicine may alleviate and help for a time, but unless the cause be removed it will not amount to much. I should like to hear this subject discussed thoroughly through the columns of this paper, by the farmers who have had experience in this matter. I would say, thus far I have been favored and the disease has not got hold of my dairy, although my neighbors have not been so fortunate, and it is so general in this vicinity that it would seem a miracle if my dairy should escape infection. I have made the remark sometimes that if I should be favored and my cows should not be infected, I should think that it might be due to feeding them quite heavy with wheat bran. I know of another farmer near me that is a well-read man and a practical farmer, that has experienced no trouble with his cows with this disease. I understand he feeds liberally with bran and also feeds fine bone meal to them. Do you think this disease could be incurred by not feeding a balanced ration, thereby reducing the health of our cows? And would not a nerve food tend to keep the cows from disease?"

This comes from a state which was entirely free from the disease thirty years ago. This writer very properly wants "to get at the cause and remove it if pos-

sible." To ascertain the cause, a man must be with his herd constantly and know precisely what kind of feed the cows get and how much. During the twelve years this matter has received attention, the writer has been away from home but one night and is seldom away at feeding time, and has complied with the conditions given above in regard to being with the "herd constantly." Life is too short for one man to master a dozen different things. The trustees of our higher institutions of learning recognize this fact; that a man must spend his life studying one subject in order to excel. One man devotes his life to the study of Greek, another to Latin, a third to mathematics.

To learn anything about farming a man must devote his time and his thoughts to the business. He will have very little time to spend at the World's Fair or in managing political conventions, or in any business that will call him away from home. Those who read the following pages may be prepared to continue the study of the subject only partially investigated during the last twelve years. No rule of action is worth much if it fails occasionally. I am well aware that my work is not completed, for my rule has worked in every case but one, and I may spend several years upon that one case before I learn anything better. Formerly a cow that aborted was fattened and sold for beef, but this seemed to be a cowardly way of getting out of danger and I finally concluded to face the monster that has terrified so many, both in this country, and in Europe. For eight years no cow that aborted has been slaughtered and every cow except one has three times carried a calf full

time, and always given birth to a calf in perfect health, and has always been a regular breeder ever since aborting. Hoping a few facts have been picked up that will be of general interest to cow owners, I will now go over the ground where I have often groped in darkness and uncertainty.

To give the younger people an idea how to commence to study a subject like this, we will go back to Sir Isaac Newton. His question, "Why does the apple fall?" was the means which finally revealed to all mankind the great law of gravitation. The habit once formed of asking why anything happens, will, in time, make your mind a vast store-house of knowledge.

The first step is to look for a cause. Why does a cow abort?

1. In half the cases the cause is over-work. In heavy soil which contains some clay, I can plow two acres in a day with two horses, but in practice I find it much cheaper to use three horses, and at night instead of coming in with two horses so tired that they refuse to eat, I have three horses comparatively fresh and ready for supper. By putting the work on two horses they would require extra feed and they would be soon worn out, making the actual expense greater than to keep three, giving them cheaper feed and having them fit for work many years longer.

I can make 800 pounds of butter in a year from two cows, but in practice I find butter costs me less per pound to use three cows to do the same work. A farmer, living in the dairy region of Elgin, said that they ruined their cows for dairy purposes in two years, by

high feeding, and sold them for beef and bought fresh ones. Such cows may do wonders for a little while, but they are soon worn out. An engineer may run his train seventy-five miles in an hour, but it is dangerous business, and most of us would prefer to buy stock in a railroad that was managed by reasonable men and move their trains twenty-five or thirty miles an hour.

Reading big stories and trying to get a bigger story to publish, has ruined many a fine herd of cows. Feeding corn meal, oil meal and cotton seed meal to excess has a tendency to weaken the organs of generation and cows will often refuse to breed at all, and those that will breed, will not carry a calf the full time. A man who had charge of a Jersey herd told me that they fed heavily upon corn meal, one winter, and the cows refused to breed. They finally dropped the corn meal and fed bran, and they had no more trouble afterwards.

A man once reported to the papers an average of more than 300 pounds of butter per cow in a year, which is not very high for mature cows; if the cows included several heifers, the yield is beyond what they would do without over-feeding. Whatever the case may have been, abortion went through the herd, and it made me suspicious that it was a case of overwork. Without knowing all the circumstances, it would be impossible to state positively what the trouble was at the start. In another herd of cows and heifers, with a reported average of 300 pounds of butter per cow annually, abortion raged for years.

By coming back to my own herd, where all the facts are known, there is positive evidence upon which to base

an opinion. The first case of abortion I ever had was undoubtedly caused by overwork, which means over-feeding. There was a scanty supply of butter for our own family and another one, and I increased the feed considerably. There was a root cellar under one part of the barn, filled with beets and carrots, which are safe to feed to any reasonable amount. Carrots and meal were both increased with good results as far as the yield of butter was concerned. Within two weeks there was a very small dead calf in the stable to remind me that there are penalties for breaking any of Nature's laws. The cow that had the most feed was the one that lost her calf. The cow refused to breed again and was ruined. There was considerable loss for she was rather young and I have never seen a dozen better cows. Mistakes of this kind have cost me hundreds of dollars and no small amount of anxiety to ascertain the real cause of the trouble and find a way to turn the apparent loss into gain by learning a lesson for the future, worth a little more to me than I had paid.

2. Salt mixed with the feed has caused abortion in thousands of cases. Salting hay is a very dangerous practice, and many farmers have asked me what was the trouble with the herd, and when I ask them if they put salt on the hay and get an affirmative reply, I tell them there is no need of looking any farther. A little salt would do no harm to any animal; forcing them to eat too much causes the mischief. A cow will not eat too much if the salt is not mixed with her feed, provided she has access to the salt all the time. Salting once a week or once in two weeks is unsafe. A boy,

working for me, had a pint basin half full of salt to mix with ensilage to feed to three animals. When I found he had been doing that for some time, I told him never to feed them again. One of these, was a heifer with calf, and in a few days her calf came away. Another instance of the same kind convinced me that we cannot be too careful how we use salt. A cow that had been kept in the city for a long time, probably without salt, was put in the pasture with the rest of the herd and she ate as much salt as any four of the other cows, and in three weeks she lost her calf. Being nothing but a common cow, she was sold for beef a few months afterwards. In the former case the heifer was the nicest of anything in a large Jersey herd, and she has been kept for years and never carried her calf full time but once, and she is the only cow in the herd that has thus far proved incurable. Can there be any reasonable doubt of the statement made before, that salt deranged the system, and time has never been able to repair the damage? By staying at home all the time, I know all the circumstances and conditions, and have in every case found a reason for miscarriage, and have never found but one case that could not be cured within a reasonable time and that is the heifer just referred to.

3. In this part of the country, we have had many dry seasons when the grass in the pasture was all burned up and we had to depend upon corn cut green. One season when the corn was pretty well eared, a cow aborted and I took the hint that I was feeding too much and stopped feeding twice a day with corn and substituted some other feed, and I had no more trouble.

Many think that the smut, growing upon the stalks, is responsible for a good share of the cases of abortion. I have never been able to collect any evidence that proved the theory correct. When there is a great deal of smut, there is often not a case of abortion while we are feeding the corn, which has convinced me that it is not so very dangerous, although we would all prefer another kind of feed if we could ever get rid of the stuff.

Clinton W. Smith, of Michigan Agricultural College, has been conducting experiments with this fungus growth which bears upon the question under consideration, and is printed here for the benefit of those who have not seen it:

SMUTTY CORN OR STALKS FOR COWS.

AN OBSTINATE FUNGUS.

Eds. Country Gentleman.—Ever since, as a small boy on a Western New York farm, I had to feed corn stalks to stock, I have been interested in the question whether the smut so often present was injurious to the animals to which it was fed. To test the matter, four cows, in various stages of pregnancy or milk-giving, were placed in the stable in the fall of 1895, and fed corn smut in excessive amounts through the winter.

The smut was gathered from a corn field so badly afflicted with the disease that several wagon-boxfuls were obtained without difficulty. It was not attempted to separate the smut from the abortive ears or stems to which it was attached, though as little foreign matter was included with the smut as possible. When gathered, the smut made a large black pile in one of the rooms in the station barn. It kept without decay or

apparent change of any kind. It was very light, so much so that half a bushel of it weighed no more than ten pounds. The smut was fed to the cows mixed with their grain feed of corn, oats, bran and oilmeal. The coarse fodder consisted mainly of corn stalks with a little hay.

To two cows small doses were at first given, and the quantity very gradually increased. The other cows had a rapid increasing quantity given them daily until they were taking from a peck to half a bushel of the loose smut a day (3 to 10 pounds). Although the cows were closely watched, no ill effect of these excessive doses of corn smut was apparent. The temperatures did not vary. There was no sign of abortion in the pregnant cows. The milk yield was normal and regular, and the bowels were neither suspiciously loose nor constipated. In no way did the system of the cows seem to suffer from the consumption of the corn smut. The cows ate the stuff with great avidity from the start.

No alkaloid or poisonous ingredient was discovered. It seems to be pretty well settled that as far as the health of the stock is concerned, it is a useless expense to remove the smut before storing the crop, either in the silo or in the mow.

The life history of the disease is not fully understood. This much, however, is known: The dark brown or black spores which make up the mass of the smut boil do not germinate in the fall of the year in which they are produced. If the conditions are right, they will germinate the following spring and send out secondary spores or "conidia," which may dry up and

be blown about by winds. When one or more of these minute secondary spores alights on a leaf of the growing corn, it is washed down into the leaf sheath or some other tender part of the corn plant, and there grows, sending its thread-like mycelium through the outer covering of the stem, and after fourteen days giving rise to a smut boil.

The smut spores germinate in manure or manure water or in pools of water in the field. Passing through the digestive organs of the horse or cow does not prevent their germination. Again they will retain their vitality for eight years at least if buried in the soil if, for any reason, the conditions are not favorable to their growth.

It is for this reason that this disease of corn is so difficult to combat. If the smut boils are cut off and left in the cornfield, the spores will be spread by the winds of fall, winter and spring and will be ready to germinate in the next year's cornfield. If not removed, the spores will be carted to the field in the stable manure, and be ready then to affect the growing crop. Again, the persistence of the spores, their remarkable vitality would cause the disease to recur, were the utmost pains taken to eradicate it from a farm for a series of years in succession. Moreover, unless the whole neighborhood joins in the fight, the winds would render nugatory the efforts of the individual farmer. We have tried spraying the growing crops with various solutions, but so far with negative results only. The successful method of fighting corn smut is yet to be discovered.

—CLINTON D. SMITH, Michigan Agricultural College.

4. One winter two cows in my herd aborted while I was feeding rye and oats ground together. The rye seemed to be free from ergot, but the trouble could be traced to no other source, and the rye was all sold. There was no more loss from aborting that winter, although some measures were used to stop it which will be given in another place. Rye hay is excellent for horses, and, when farmers have it, the greater part can be used in that way. In regard to rye pasture there is only a suspicion without much evidence to condemn it, and those who have trouble after pasturing cows on rye should report to the agricultural papers.

5. Fright will sometimes cause a cow to abort. I had a cow easily frightened at any strange noise. Within eight feet a sow had a large litter of pigs during the night and several had been killed; probably they didn't keep very still while they were dying. In the morning there was a calf two-thirds grown.

6. Oil meal, fed after cows go out to grass, should be avoided. When selling a certain amount of cream, I found I was running short when the cows were in the pasture the last part of May. Oil meal was used for a week, when a cow aborted leaving a strong suspicion upon my mind that oil meal was responsible.

7. Bodily injury may result in the loss of the calf. This is, perhaps, the first full statement of the different causes of abortion, from a farmer's standpoint, ever published. There may be many other causes. This covers all the cases I have ever known.

There is another thing equally important. What

are the symptoms? I have read dairy papers for years and read reports of farmers' institutes and state dairyman's conventions, but have yet to find the first word upon the subject. For years I watched without finding any warning signal. Finally, when going through the stables the last time at night, I noticed certain cows had a white discharge from the uterus, and in two weeks some of these aborted, and I fed a teaspoonful of phosphate of lime daily to each of the others and stopped giving grain of any kind, fed no salt for a week and then only a teaspoonful a day. This seemed to stop what might have been a fearful contagion.

With me the use of drugs has not been successful in the prevention of abortion. One cow made a practice of aborting in five months. I gave drugs recommended for the purpose, and this time she carried her calf seven months which seems to be encouraging if we say no more, but the calf had evidently been dead two months. The only effect of drugs seemed to be to produce contraction of the organs to prevent the escape of the calf after death. I could see no advantage in that and discontinued using anything of the kind.

Rest, phosphate of lime and coarse feed without much grain are my remedies for abortion. Do not breed a cow for eight months after aborting and she will not be likely to trouble you again if you feed grain rather sparingly till she drops her next calf, and give rather a small teaspoonful of phosphate of lime three times a week. Rest is the main thing and if you breed an aborting cow in two months, she will not be likely to get back to her normal condition.

CHAPTER VI.

THE SILO.

Presuming the reader would like a little change, we will now drop the sick cow and study a little upon the subject of ensilage. A few silos were built twenty years ago and they have gradually increased, but have never come into general use. If we go through any state and inquire, there would not be found more than one silo to fifty farms. In this township of six miles square there are silos in use on six farms; in two of the adjoining townships probably there are none. There have been three distinct eras in building: 1st. They were built of stone, or concrete, a mixture made by using four parts gravel and one part common cement. 2nd Farmers finding that ensilage would spoil near the wall began to build wooden silos and paint the inside with coal tar and gasoline; both of these kinds were square 3rd. They built round silos because the ensilage would spoil in the corners of the square ones, and for a year or two they have used long staves and iron hoops which can be tightened when the wood shrinks.

Of the three kinds of silos mentioned, I prefer the square one built of lumber, with corners cut off a little. I have one with a wall four feet high for the lower part and more ensilage spoils near the wall than near the boards. The reason for choosing square rather than round will appear hereafter. The

silo I now have consists of two rooms sixteen-foot square and eighteen feet high, three feet of this is below the surface, so that a carrier twenty feet long answers the purpose. This is extended under the plate instead of over. Many use carriers thirty to thirty-five feet in length with no end of vexation on account of broken chains and gearing.

The old way of filling would seem now rather amusing. In 1883, I had a chance for the first time to see how a big silo was filled. The corn was Southern white dent and very green, standing about twelve feet high. Two men did the cutting in the field; six men with one-horse dump carts did the drawing; one man was running a steam engine; two were handling and feeding the long corn into a feed cutter; two were inside the silo leveling and a boy rode a horse over the cut ensilage and tramped it, and, when it was filled, it was covered with plank and weighted heavily with stone. Again in mid-winter, I visited the silo and found the ensilage green as when put in and sour like sharp vinegar. Such a pit of feed would today be called almost useless.

Northern corn is used which allows it to become more mature and it has more ears and will not sour if put in slowly when rather green and rapidly if rather ripe. In winter it is just as good as when taken from the field.

It is considered a very easy matter to fill a silo and save the ensilage in good condition. Not quite so easy for beginners. The first year half of my ensilage spoiled and no one could tell me what was the trouble. Years afterwards I came to the conclusion that there



BELLE OF GENESEE LAKE, 59798 A. J. C. C.; 44 lbs. Milk per Day, 17 lbs. Butter in a Week.

Owned by N. B. White, Oconomowoc, Wis.

were three mistakes: 1st. The corn was too ripe when put in the silo. 2nd. The cut ensilage was allowed to remain in a pile over night and heat and then it was spread around in the morning. 3rd. There was a door near the bottom of the silo, which we opened when we began to feed in the winter, and it gave a good chance for the air to enter the ensilage and make it heat and mould. It should have been opened on top, for fire cannot do as much damage on top as burning in the side. The hot ensilage spread in the morning, would mould. It should have been leveled at night instead of morning, and when we find a mouldy spot in the center of the pit, it indicates that some one dug down into the hot ensilage to find out how hot it was.

The second year, nearly one-half was lost. The third year, I began to learn something and parted the silo in the middle, leaving two silos twelve feet square. I opened one at a time from the top and had none spoil that winter, although it froze considerably from the top. By covering with marsh hay and digging eight inches deep each day, we avoided much frost, but the whole of it was down near a freezing temperature. What great gain is there in warming water to seventy degrees and feeding to each cow, two bushels of ensilage about thirty-two degrees? Aside from the cold there was no trouble that winter, for the corn was green enough when put in and so heavy that it packed nicely, and in those days we weighted heavily in the fall as soon as filled, which made the whole mass solid and excluded the air.

For the fourth season I filled the same silo and

had rather more trouble from the frost. Otherwise the ensilage kept in good condition. The fifth year I built a new one, having moved to another farm. This time there were two pits sixteen feet square, and for the first time I covered the ensilage with chaff and tarred paper and put on no weight. The ensilage kept well until opened, when it troubled about heating and moulding, and nearly one-half was spoiled. In the first silo each pit had 144 square feet and I could feed fast enough from the top to prevent moulding; now I had 256 square feet and I was in trouble again. I read everything published about ensilage, yet nobody told me what I wanted to know.

The sixth winter, I covered with chaff, then a layer of boards, then tarred paper, followed by a second layer of boards and then a foot of straw to keep the boards from warping. During the winter I blundered along, trying several ways to keep the ensilage. As a last resort, I began on one side and took out ensilage one foot in depth and then covered with boards behind me as I proceeded across to the other side. After I had gone across and dug down another foot and began to go back I found the ensilage very hot and mouldy under the boards. As I proceeded along backward, I thought of something new, which has proved to be just the right thing in the right place. I put poor ensilage on top of the good and then two layers of boards, breaking joints, and the good ensilage remained good. The poor ensilage and the boards excluded the air and that ended the trouble. For five winters the same plan has been followed with good results. It makes no difference

how warm or how cold the winter, the ensilage always comes out warm, fully up to blood heat and there is no chance for any to mould for very little is exposed at one time. On no other farm do they handle ensilage in this way. Too often in other silos, I have seen mouldy and frozen ensilage, both unfit for feed. In a round silo boards could not be handled very well for covering, and that is why I prefer the square one.

The losses in the five years of bad management with the ensilage, were not less than \$100. Did one man ever before do so many foolish things before he found the right way?

This method of keeping ensilage covered with boards while feeding has many advantages in a dry time in the summer, when grass is scarce. In the hottest weather it moulds no more than in winter and the only reason no one else tries it must be because it is not patented. Some cut down four or five feet in depth, leaving much of the end exposed for a week or more. One foot in depth on this farm till some one else owns it and then no spot will be exposed forty-eight hours. This must work perfectly under all circumstances and all temperatures. If some agent would come around offering to sell a farm right for \$5, how many thousands in the United States would buy it!

So many have seen farmers filling a silo that this part of it might be omitted entirely, were it not for studying economy, by arranging every detail so that we use all the help to the best possible advantage. Learning this part of the business has been quite expensive to us. The first silo was built in the side of a hill and

we used a small cutter run with a one-horse sweep power and did our drawing from the field with one horse. Having an opportunity to fill from the upper side, no carrier was needed, although it was quite a task to move the ensilage by hand the whole length of the silo—twenty-four feet. Two years was enough of that and the next move was to part the silo in the middle, and used a carrier twelve feet in length, so arranged that we could fill either pit without moving the machinery. The corn was drawn from the field in a two-horse dump cart, having high stakes and attached to the forward wheels of a wagon.

Moving to another farm, where we built a silo on level ground, a longer carrier was required and the two-horse tread power did not work as well, and for two years we used a sweep with six horses and a driver; this was four horses and one man more than we needed, as we learned afterwards. The tread power was set up so that we lost half the motion by using a short belt and we did not cross it, which allowed it to touch the pulley only upon one-half the circumference, and required the belt to be drawn tight producing unnecessary friction upon the cutter shaft, the same as a load will produce friction upon a wagon axle. Another farmer used his tread power successfully for filling his silo, and he claimed the new powers would do more work than the old ones. After he was through filling, I hired his power and asked him to set it up. He used a long belt, setting the tread power eight feet back of the cutter and crossed it which of course changed the direction of the motion and allowed the belt to touch two-thirds of the pulley

instead of one-half, and the sag in the long belt would move the machinery easily without tightening very much. The next season I tried the old power set up in the same way, and I found it worked just as well as the other, the advantage gained was all on account of the arrangement of the belt. The threshing machines in the eastern states have been run for forty years with one-third the power thrown away, and it took more than thirty years for me to find it out. Horses have been compelled to walk up a steep grade when a much less elevation would have done the work. How much power has been thrown away if we compute the loss of one-third the force and allow that two hundred thousand tread powers have been running threshing machines for two months in a year for forty years! We talk about farming being up-hill business, and we make it so, because, like the horses in the tread power, we are traveling up a steeper grade than necessary, because we never stop to think. Looking back to the beginning of this book you will see it is "dedicated to those who can both think and work." Those who work and never think necessarily throw away one-half their work. What part of our work did we throw away when we used six horses on a sweep? We can do more work with two horses on a tread power and need no driver. We pay as much for a man's work as we do for the work of a pair of horses and we are using only one-fourth the labor we did before and it looks as though we had been throwing away three-fourths instead of a half. These pages are not written so much to show men how to work, as to show them that they must think while they

work. We do a thousand things the way our fathers did, because we never try to find a better way. In the eastern states you will find that every horse hitched to a two-horse sled, has a dead pull and if one horse is willing to pull the whole load, and the other is willing he should, there is nothing to prevent. For twenty-five years I supposed that was the proper way to hitch a pair of horses to a sleigh, so they would each pull independently instead of hitching them to an eveners so that they can pull against each other. In New England that has been the custom for two hundred years, and perhaps was the custom of their ancestors for two hundred years before, and it will be the custom of their descendants for two hundred years to come, unless there is someone who begins to study principles of philosophy and can apply those principles to matters of every day life.

Farmers generally say that it costs too much to fill a silo and they cannot afford anything of the kind. If two or three kinds of corn are planted so that the earliest is ready to cut by August 25, there is no more expense than in harvesting corn any other way. Five men put in fourteen acres in thirteen days, in 1895. There are two of us here all the time and we hired three extra men, some of them at the rate of \$15 per month as long as wanted because very many were unable to find work at a higher price. The extra expense for filling the silo was \$28 or \$2 per acre. Is there any quicker way for five men to harvest an acre of corn if they take care of all the fodder? At the Vermont Experiment station they found the ensilage worth a little more than

the same amount of corn husked and ground and the meal fed with the stalks. Now, if we want to make it expensive to fill, that is easy enough—plant late corn and begin to fill just before it is time for frost, and if the corn is considerable distance from the barn, a great gang of men will be required to furnish corn enough for an engine to cut, and two men are required in the silo to take care of the ensilage. We have sometimes paid \$75 for filling a silo not reckoning the help we usually keep on the farm. The difference between \$75 and \$28 will pay a man for using a little extra time for arranging his work.

When we work with a small force we send three men into the field in the morning to cut corn enough so that one man can cut the remainder needed for the day, and have time to help the driver load the wagon. One pair of horses is used in the tread power and another pair on the wagons, changing horses from the power to the wagon as often as necessary. There are two long low down wagons and by changing from one wagon to the other, one pair of horses can do all the hauling. One man feeds the cutter, another takes the corn from the wagon and during a stop of ten minutes after cutting each load, the feeder and the handler can level the ensilage. Whenever the knives need filing and the machinery needs oil, one man levels the ensilage, which must be done every load to secure an equal distribution of the ears. A total of four men and four horses can keep the work moving until the silo is so full that one man is required inside all the time. The extra expense of filling the silo will run about like this:

Using six horses on a sweep, \$75; hiring a threshing engine and a gang of men, \$50; filling with four or five men and using our own horses on a tread power, \$28. It will pay a man to look over these figures and in every kind of work on the farm the cost may often be reduced one-half.

Further explanation may be necessary in regard to loss of power caused by setting up machinery according to the custom of machinists years ago. There may seem to be an inconsistency in the statement when a man loses half his work and there is only one-third loss of power. All the circumstances can be better understood by using a three-horse tread power. When a feed cutter has a carrier twenty feet long, it will require the weight of one horse to move the machinery, the weight of the second will allow the feeder to put in corn stalks slowly, the weight of the third horse will give force enough so that he may feed rapidly—in other words if he could put in ten stalks at a time when using two horses, it is evident he can put in twenty with three horses. The rollers draw in the corn and the work of the feeder is nearly the same in both cases and if the first case he accomplishes only half as much and in that sense half his work has been lost for with about the same effort he could cut twice as much corn in a day and all his work would count to the best advantage.

Now to go back to the two-horse tread power, we will see how ignorance may cost a man two or three dollars a day. For three years we used the short belt not crossed and we must count the use of the machinery had it been hired, the time of one man to unload corn

of one man to feed and of one man in the silo and the horses. At the time mentioned we hired a man on purpose for work in the silo. One of my neighbors hired the machinery eight days one season and paid me \$12. Reckoning the time of each man worth \$1 per day and the pair of horses the same, and all were used twice as long as necessary it seems that half the time of the men was thrown away every day, and the same may be said of the machinery and horses, making a daily loss of \$2.75. I am telling my mistakes to save others the expense of taking the same course. I have been thus explicit, so that all may see the statement is correct. For two seasons we used six horses on a sweep, losing the work of four horses and a driver or \$3 per day, and like everybody else, I have been complaining about high taxes and the question comes up, are fools ever taxed enough? Horace Greeley used to say, "A fool and his money are soon parted." Some one fearing a fool might be discouraged, flatters him by giving him another name in this way: "A wise man sees his mistakes, but a fool never."

Now, with the silo on the south and the horses facing north and twice as much belting and the belt crossed so that it hugs the pulley on the cutter, we can do twice the work we could in the old way and it seems easier to work when everything is moving along than it does when everything drags. Who would not rather plow a day with a pair of horses that are full of vim and move at a rapid pace, than drag along behind a slow team for the same length of time?

For years I had read everything about filling a silo

and yet I had a great deal to learn by experience. Experimenting with feed cutters cost me \$40 and considerable annoyance by breaking down when corn was drying up and needed to be cut immediately. One time a head to which the knives are attached, broke when feeding very slowly and nothing but corn stalks went through. I telephoned for an extra head and in four hours it came, but when we undertook to put it on the shaft, we found the head too small. The parties who kept the extras had a summer home near our farm and we asked them what was the trouble, and they stated that the late cutters had a smaller shaft. When they went to the city in the morning, we sent in the one they had brought out and when they returned at night, they brought what we needed. Here was a loss of a day and a half, and the most of it was caused by cutting down the size of the shaft, which was done for no purpose of necessity for it does not require a great machinist to comprehend the fact that a shaft is no better by being reduced in size one-eighth of an inch. Many of these breaks occurred, and one time I sent off three miles and hired a Smalley cutter not then used by the owner. For three years I hired the same cutter and then I bought one like it which I have used four years and during the seven years those cutters have run without a break.

The best method of planting corn for ensilage, is a matter that will never be settled. It is usually planted in drills and twice the corn used in this part of the country that should be planted. Eight quarts to the acre will furnish plenty of ears while sixteen quarts will give long earless stalks of little value except to fill

the silo and fill the cows. One ton of well eared corn is probably worth more than three tons of thick growth largely shut out from the sun's rays.

In a dry season, corn planted in hills and cultivated both ways will do much better than drill corn. We usually plant half each way in order to watch the growth under the two systems, putting the drill corn on sod and the hills on old land, where it is more difficult to subdue the weeds. A good harrowing just before the corn comes up will do more to kill the weeds than four times the work with a cultivator, two weeks later. The harrow, if it has round slanting teeth, may be used till corn is four inches high. Some corn will be torn out, but a little thicker planting will be required where this system is practiced. Heavy rains often pack the soil around the corn and the harrow is much better than a cultivator which can only stir the soil between the rows. Sod is the best land for corn, for it does not pack like old land, but we often have trouble with worms. One season the worms kept a ten-acre field of corn gnawed close to the ground till the middle of June, when they entered the ground to be transformed. The corn afterward grew up from the roots and made half a crop. This trouble occurred on spring plowing. When plowed late in the fall, freezing and thawing will usually destroy the eggs.

CHAPTER VII.

FEEDING FOR SIZE.

In 1881, I began to handle Jersey cattle. Two characteristics at once attracted my attention—the cows gave very rich milk and were inclined to hold out well. A grade Short Horn cow in the herd having the same feed and care, was dry five months in the winter and for the month before drying up, she gave but little milk so that her working period was only six months out of twelve. The Jerseys gave milk for ten months out of twelve and at the end of ten months we had to cut down their grain feed to dry them up. They had two very desirable traits and the only serious objection to them was their small size. I had seen several herds of Jerseys weighing from 700 to 900 pounds each, and if we take the average for the country, they will not weigh much over 800 pounds per cow.

I have endeavored to overcome this “only serious objection” and have so far succeeded that J. H. Green, of Waterville, Wis., said: “You may look the whole United States over, and you cannot find another Jersey herd that will compare with yours in size!” I recently sold a registered Jersey cow that weighed on the scales 1200 pounds and I have had four as large as that in my barn at one time. I sold a bull that had had no grain to fatten him, that weighed 1500 pounds. I once ship-

ped away a calf by express, and the buyer wrote back, "I thought the Jerseys were a small breed of cattle." A man while looking over the herd and noticing the large size, said: "You must be a good feeder." The opposite is true. From my earliest recollection, I began to pick up facts in relation to farming. In my boyhood the rocky hillsides of New England were cultivated with oxen and we fed them good hay, but no grain. One of our neighbors bought a yoke of oxen always poor and gaunt and you could lay your hat in the big hollow behind their ribs. He departed from the usual custom and fed them meal made from corn and cob ground together. For several months he continued this method of feeding to no purpose and he finally sold them looking as hard and poor as when he bought them. The following winter my father returned from a visit to the "best farmer in town" and said he found those poor oxen in his barn, looking so fat and sleek that he hardly knew them. What had been their feed? Hay, nothing but fine, early cut hay. An Ohio man wrote to an agricultural paper that he had a pair of horses in good condition and they had had nothing for two years, to his knowledge, except "grass and grass dried." A horse dealer once cautioned a farmer about buying a horse from the livery stables where they had been over-fed with grain.

In the dining room of a hotel in the White Mountains of New Hampshire, you will see this inscription: "Fames condimentum optimum:" Hunger is the best sauce. Now, instead of high feeding upon grain, I have used hay and roots, heifers not even tasting of grain from the time they were weaned until about the time

they dropped their first calves. Feeding grain is like feeding children on sweet cake—they are generally puny and sickly. If you want to see strong, healthy people, look at those who were brought up in poverty, in Germany, eating nothing but coarse food. Feeding grain or any kind of concentrated food to young cattle while they are growing will leave them with a small stomach, while coarse feed will increase the size of the stomach and give them good digestion. Many destroy the appetite of animals by keeping feed constantly before them. Bushels of hay and ensilage are daily taken from their mangers, while my cattle eat everything, unless we except the butts of large corn stalks when dry. Frank H. Taylor, of Reedsville, Pa., writes: "The bull I bought of you is a good feeder," and after buying a heifer, he wrote, "I have never seen cattle so bealthy and vigorous as those I bought of you." F. P. Hartwell, of Summit Center, Wis., said, "the heifer that came from your place always cleans her manger, no matter what the feed." These animals were registered Jerseys, sold when calves, but their ancestors had been under my care for years and they had their digestive apparatus so well developed that good digestion was transmitted to their offspring. Farmers often laugh at book learning and dead languages, but the farmer who can fully comprehend the Latin inscription just quoted, has a treasure worth hundreds of dollars to him. I once found in a bull pen a large forkful of hay not eaten. Upon inquiry I learned that a coachman, who kept his horses in the same barn, had fed him and his excuse for doing it was "you are starving that bull

to death!" A little Jersey calf, two months old, had been put under my care; to me he looked very small and unpromising, but here he was now weighing 1500 pounds and I was accused of starving him to death!

For several years I have not had as good success in raising Jerseys of large size, for four things have worked against me—First, selling milk; second, a succession of dry seasons; third, using ensilage instead of roots; fourth, the horn fly, a little pest which comes two months earlier than the common fly and works day and night. Nevertheless, with all these drawbacks, I have no difficulty in raising cows averaging 1000 pounds each, which is as large as our native cows were before they were crossed with Short Horns and much larger than you will find them on the island of Jersey or on most of the farms in America.

Many think ensilage a good substitute for roots and of equal feeding value. This is not the case for young stock unless we feed bran and middlings with the ensilage. Hay and ensilage alone will produce no growth to compare with hay and roots. The chemist tells us that roots are composed mostly of water and apparently have little feeding value, but he admits that there is something about roots that aids in digesting other feed and in that way an animal gets more value out of a bushel of roots than the analysis shows. Men may err in judgment or testify falsely; not so with cattle. When they tell me one kind of feed is better than another, I have never caught them in a lie. The immense amount of labor required for raising and feeding roots, has made it necessary to abandon the business.

With deep regret I admit there is nothing to take their place. When there is an abundant crop of potatoes, I put them through a root cutter and feed a few every day. They are hardly equal to turnips and beets. I supposed them superior until my young cattle told a different story.

There is another reason for the small size of Jerseys. They are inclined to breed young, and farmers often allow them to drop their first calves when twenty months old and in ten or eleven months they drop their second calves, and this system of frequent breeding is continued until they are worn out and they refuse to breed at all. On this farm Jersey heifers do not drop their calves until they are past two years old, sometimes being two and a half, and their second calves fourteen months later. This gives them a chance to grow and rest. Overwork is not necessary to develop a cow. The best cow I have seen in thirty years, dropped her first calf when she was two and one-half years old, and her second when she was four. Hundreds of dairy-men say a heifer will never make a good cow unless you breed her young and breed often; if not bred in this way, she forms the habit of turning her feed into flesh and tallow, and this habit will follow her through life. This may be true when young cattle are fed upon grain during the winter, for I have noticed that over-feeding and overwork go together.

When a man buys "fancy" stock, as many farmers call registered cattle of my breed, he wants to make as good a show as he can, and a calf is fed so that he is fit for veal and when six months old will weigh 150 pounds

more than mine, but when four years old mine will be 200 pounds ahead. I want a large frame and a chance to count the ribs until finally fattened for beef. When tallow is worth four cents a pound and butter twenty cents, only the rich can afford to make their grain into tallow instead of butter. When a man looks over my cows and sees them a little larger than he finds on other farms and thinks the extra size means that I am a "good feeder," he makes a serious mistake if he means that I feed a large quantity of grain. I admire fat, sleek calves. Can a man afford to raise them simply for their nice appearance at the sacrifice of profit? Can a man afford to burn up ten dollar bills to make a bon fire that will be pleasing to the eye? It is probably true that there is money enough lost by injudicious feeding to pay all the taxes in the country. "Let your moderation be known to all men."

CHAPTER VIII.

VALUE OF DIFFERENT KINDS OF FEED.

In determining so important a matter, the cows are the Supreme Court to which the whole question is finally submitted, and from their decision there is no appeal. In March, 1896, there was a general falling off in milk and I conjectured that the corn in the silo needed something to balance it, and I began to feed four quarts of wheat bran and one pint of oil meal to each cow, in addition to what they were getting already. There was considerable improvement at once. Wetting wheat bran with warm water seemed to give much better results than feeding it dry, and the fresh cows that had six quarts daily prepared in this way, in addition to the other, held out remarkably well, there being no noticeable shrinkage, while they were kept in the barn. A cow that will give a pailful of milk twice a day and keep it up will earn a great deal of money in three months. Whether the feed was the best in the world, I can only add that it came the nearest to hitting Prof. Stewart's standard—rich pasture grass—for when the cows were turned out to pasture, where the feed was the very best, there was no increase in quantity of milk, I only noticed while skimming that the cream seemed to be thicker and more of it.

The whole feed for a day consisted of two bushels ensilage which was made from corn having fifty bush-

els of ears to the acre, mixed with eight quarts wheat bran and three quarts middlings or shorts and one pint of oil meal, and all had one feed of timothy hay at noon. Clover might have been better, had we been able to raise it. To the fresh cows, one-half the bran was fed in a pail as slop. Scarcely any two cows were fed alike, but this is given as the average.

Considerable has been said in these pages in favor of feeding wheat bran, now, to prevent misapprehension in regard to this matter, I will state that feeding bran dry and using hay of any kind for the rest of the feed is a very foolish way of expending your money. The best results are obtained from bran, when we compound with heavier feed. One ton of corn meal and one ton of wheat bran are undoubtedly worth more than two tons of corn meal. The same may be said when we mix bran with middlings or a low grade of flour.

The following is copied from an old scrap book, authority unknown:

	VALUE PER 100 POUNDS.
Timothy Hay.....	\$0.62
Barley.....	1.04
Oats.....	.95
Rye.....	.98
Corn.....	1.15
Rye Bran.....	1.02
Wheat Bran.....	1.02
Cotton Seed Meal.....	2.10
Linseed Meal.....	1.66

CHAPTER IX.

KEEPING COWS CLEAN.

In the Northern States for six months in a year, one-half the cows have their sides covered with manure, some portion of which goes into the milk pail every day. A city caterer once told me that his cream was always strong in the winter. Various devices have been invented to keep the cows clean in the winter, but the most curious of all is a floor, the back part of which consists of iron grating.

In one barn, I saw the cows kept in box stalls and I have done the same thing, when I had tried so many ways of fastening and all of them furnished a barn full of dirty cows in the spring. When a farmer keeps a large herd of cows, box stalls are out of the question on account of the immense amount of work required to tend them and the great cost of building large barns. When the cows are allowed to stand beside each other and have some kind of fastening, how quickly a man may drive thirty cows from the yard and have them fastened in their places! Did you ever notice them as they come in and each cow chooses her own stall? Here are thirty stalls along the row precisely alike, and a man could with difficulty pick out the stall of any particular cow, while each cow knows as she passes along where she has stood before. Is she guided by sight or

smell? A bird may have a nest in a thousand acre wheat field and fly all over it and return to the same spot at any moment. This seems to prove that the lower order of animals must have "locality" stamped upon the brain while man has not. This would naturally lead us to the discussion of "instinct" which will be considered in another place.

When a boy goes to school he begins to learn the first day, but I had been in this cow school more than twenty years before I ever began to learn anything about keeping cows clean in the stable. In 1885, I learned in two days all I ever knew about it. It happened in this way: I was keeping cattle in a barn built by another man, and he thought it was a fine thing to have a manger two feet high, and when a cow was standing her fore feet would be near the front board of the manger, and when she wanted to lie down she had two feet of loose chain and she would naturally back up so that this front board would not be in the way of her head, and lie down in the manure. If a man should spend fifty years to invent a stall which would make his cows as filthy as possible he would never find anything better adapted to his purpose! In the fall of 1896, a heifer dropped her first calf. At night she was confined in one of these stalls just described. Every morning I was obliged to get a pail of water and wash her off before I could milk her, and one morning an idea struck me, and I was in very nearly the same situation as the other man, whose neighbor remarked: "An idea so seldom strikes you that I wonder it didn't knock you down." Well, the idea was this: A cow should have a

chance to lie down as far forward as she stands. With an axe I knocked out the two front boards of the manger and fastened the chain with a staple in the board in front of the stall and the next morning the heifer was clean! The other mangers were served the same way, and for years there has never been a manger of any kind in my cow stable. Every farmer who enters the stable, expresses surprise. There is only one other instance of the kind on record. The associate editor of *Hoard's Dairyman* stated in January, 1897, that he had no manger. The question then comes up in regard to priority of invention, but as each used that kind without the knowledge of the other, both may claim the honor of inventing the stall. Who wants to pay \$5 for a farm right? As far as the writer is concerned, all may have a chance to use the patent stall one hundred years free!

Before feeding ensilage we pass along in front of the cows and sweep back straw, chaff and dirt, which will soon accumulate in a tight manger, and we thus very quickly, clean them all daily and there is no feed wasted. For cows weighing about 1000 pounds each, the platform should be seven feet in length. It had better be six inches too long than one inch too short. The greatest trouble I have, is with cows that have formed the habit of stepping off the platform on account of being too short. In practice we use chain with ring sliding on a pole with a piece of wooden pump tubing, eight inches long, on the lower end of the pole to prevent chain from slipping so low that the cow would be likely to step over. We use only six bushels of straw

for twenty head of cattle. At night, after the cattle are put in the stable, we pass along with card and brush and clean any cow if necessary. There are seldom more than two in the whole row that we need to touch. Our cows come out of the barn in the spring as clean as they were in the fall. The time necessarily spent in cleaning during the winter would not exceed ten hours, or three minutes a day. This will prevent the accumulation of manure, but very much more time may profitably be spent in cleaning cows if we wish to have a herd make a good appearance.

Under our present system we hear of no complaint in regard to cleanliness. One lady, who has had 1000 bottles of milk, states that she has never seen any dirt or settlings. Before making any change in your stable, we advise you to experiment with one cow. Stanchions are in general use throughout the country, but there is a serious objection to any kind, for a cow stands with her shoulders touching the stanchions, and when she lies down she backs up the length of her neck which is not the way to keep her clean.

CHAPTER X.

WATER SUPPLY.

Until the writer was fourteen years old, the cattle on the old farm were compelled to go a long distance through the field to a brook for water in winter. In pleasant weather, they would go once a day, when very rough and stormy and the path filled with snow, they would never start out unless we drove them, and then only a part of them would drink for there was a chance for only one at a time, and the last ones were chilled through so that they would not drink. If the storm abated the following day, there would be a better show, but at best a part of them would go forty-eight hours without water and their feed was all dry hay and straw. With such feed a cow of average size would probably drink twenty quarts in a day, and from thirty to forty quarts at a time if she drank every other day. Then she had the comforts of a cold stable for the night after drinking such a quantity of water near the freezing point. Who can wonder that the cows came out "spring poor" or that the boys were anxious to get away from the farm?

The next move was to conduct the water from a spring to a trough in the barn-yard which was a great improvement upon the old ways, but the water was ice cold and cows usually drank but once a day.



NETHERLAND MONK'S AAGGIE CONSTANCE, 20556; This cow, as a 2-year old, gave 62 lbs. 6 ozs. of milk in a day; 11,201 lbs. 7 ozs. in a year and made 15 lbs. 8½ ozs. of butter in a week. Owned by Smiths & Powell Co.

Here in Wisconsin we pump all our water with a wind mill into a large tank, and we can warm this with coal, costing for a winter about \$6 for forty head of cattle and horses. Many days during the winter are too cold and stormy to turn cattle out of the stable, and I put in a three-inch iron pipe from tank to stable, and I could pump enough for a day in ten minutes. By raising boards in front of the cows, they can drink from a three-cornered wooden trough, and this is the coming water sytem for the country—warm water in the barn so that cattle may drink twice a day instead of once.

CHAPTER XI.

HEREDITY.

This is a word seldom if ever used. Hereditary is very common and similar forms we see every day. That we may understand in what sense it is used, it will be necessary to go back to another language. In Latin, "heres" means an heir. Hereditas: heirship. Similar words are used when property passes from father to son, and its general signification is that property passes from one relative to another, and here we wish to give it a special meaning in regard to transmitting mental and physical characteristics to offspring.

A son becomes the heir to his father's property because he is the nearest relative, and he has the best right to it. Does the son also inherit the brain power

from his father? If we go back to the Adams family of Massachusetts, we find a very wonderful instance of children's inheriting brain power from their ancestors. There were five or six generations that might be called brilliant, even in the literary atmosphere of Boston and Cambridge. This is perhaps the only instance in which we find so many generations of orators. Lyman Beecher was a great orator and so was his son, Henry Ward Beecher, but the sons of Henry Ward have never had any reputation as public speakers. Daniel Webster, as an orator, was seldom equaled. His two sons have left no speeches for future generations to admire. Stephen A. Douglas could hold an audience spell-bound. His sons were not especially gifted in that direction. Musical talent is generally inherited, and it is a matter of regret to me that two of the most noted singers of the age, will, within a hundred years, die without posterity. Travel through Germany and Italy and you will find two nations full of natural musicians.

Peculiarities of form and feature are often transmitted from one generation to another. Children often resemble each other, sometimes the resemblance is so strong that strangers can detect no difference. In one instance both the parents had dark complexion and some of the children had very light hair and eyes, and they were said to "take back."

Now, does this "taking back" apply to the lower order of animals as well as to mankind? If it does, there is nothing more important for a breeder of stock to study; and we here give a place to the consideration of the great question of transmission of qualities.

The facts thus far established by breeders of horses and cattle are these: When a single animal has excellent qualities, those qualities are not likely to be transmitted to the offspring, but if this animal descended from a long line of ancestors having the same qualities, we may look for the continuance of those qualities in the offspring—in other words, the offspring will “take back,” but often not to the sire and dam, but to animals many generations back.

The breeders of trotting horses have given a doubting world ample proof of the great law that “like produces like,” when a horse has descended from a long line of trotting stock. Some horses having the best pedigrees, have proved failures, but the great majority of those inheriting fast blood have been classed among “good steppers” if they have never entered the 2:30 class, and colts without any record have sold for thousands of dollars per head because there was a strong probability that “blood would tell” when the colts came to maturity.

The general experience of breeders of all kinds of stock is as well known to others as to myself, and it will not be profitable to dwell upon general facts, but I will give a little testimony about breeding as far as it has come under my own observation, and the reader may draw his own conclusions.

In my boyhood on the old farm, we had a “scrub” cow very rarely excelled by a cow of any breed. She gave a large quantity of milk and I well remember the thick cream we found upon the tin pans. Considering the feed and care a cow received in those days, I am

convinced that she was capable of making a very high butter record under our modern system of feeding. Dropping just a word here about Gov. Hoard's "nervous theory," I will state that I have never in my life seen another cow half as nervous. This remarkable cow was kept till she was fifteen years old and with one exception, she always dropped a heifer calf, and from these heifers we expected to raise the best herd of cows in the country. Facts are stubborn things, but only one of these heifers proved to be anything more than an average cow, and, excepting that one, they were all quiet and gentle. Some of the calves were sold when small and I am not able to state how those developed. For many years we stuck to this "breed" with no great success. In fact, our luck in the cow business was very similar to the cat business. We had a black and white cat, which as a mouser was never beaten; every morning there were five or six mice on the door-step. Every year we raised two or three kittens, which were kept until they got their full size and then killed, for they would all eat the mice brought home by the old cat, but a kitten was never known to catch a mouse herself! Those kittens, while they lived, enjoyed what many wise people call prosperous times.

This is similar to the story others tell about extra cows. Occasionally they have a cow very much better than the average, whether from chance or from an excellent dam it is impossible to determine what law governs the case. When a cow has descended from a line of cows of all kinds, both superior and inferior, she seems as likely to belong to one class as the other.

Those who keep thoroughbred cattle of any breed, have had a different experience. Having a long line of excellent cows for a foundation, the heifers will generally make good cows, although there are some exceptions. In 1881, I began to handle Jersey cattle, and one cow, said to be the best out of a herd of fifteen, dropped a heifer calf the following season. This heifer did not have a calf till she was two and a half years old, and six weeks before calving there was very little udder development and I felt sure she would not give more than six quarts of milk per day. The quantity proved to be sixteen quarts instead of six and we were obliged to milk her every eight hours. This was in September with only fair feed in the pasture and no grain excepting some ears on fodder corn. Her calves were hardly equal to the dam, excepting one which was sired by a St. Lambert bull of excellent pedigree. As a heifer, this one did not appear to be above the average, but she developed later and when six years old, gave forty-four pounds of milk a day and made seventeen pounds of butter a week, with scarcely any feed besides grass. Her mother had a long hanging bag; the St. Lambert blood had cut this off and made the short bag well-filled back and forward. In the face the cows looked precisely alike, even to the shape of the horns, each cow having one horn curve around so to strike the forehead. Right here is the greatest mystery of the whole breeding business. What is there about the relationship that should cause the horns to grow precisely alike, not in the usual shape, but with a peculiar curve alike in both cows? Each cow was very long and would weigh

1100 pounds. The older cow was built according to rule, being wedge shape; the younger one was squirrel shape—the fore and hind quarters being about the same size. The younger cow was a trifle better than the other, and the rules about the proper shape of a cow are worth nothing to me. In selecting a heifer calf, I would look for a long body, a thin, soft, yellow skin and for the other good qualities, I would depend upon pedigree. One of my best cows has not even the long body. For sixteen years, I have watched the herd and with few exceptions my cows have turned out milk and butter according to pedigree and not according to shape.

In 1884, I bought five heifer calves without seeing them, depending mostly upon pedigree for superiority. When they dropped their first calves, it was rather dry weather and none of them did very well, and eight quarts of milk per day was all any of them gave. Two of these had a much better pedigree than the others, but all seemed to be equally poor, and my faith in butter blood passing from one animal to another, was somewhat shaken. These two had a very yellow skin and in three years more one of them was giving twenty-two quarts of milk per day, nearly three times what she gave the first season, showing that it is not good policy to sell an animal for beef because she is inferior the first season. The other heifer with extra butter blood seemed to be inferior to all the others, and many a time I wished someone else owned her. She dropped her first calf in September, and the next June her bag was pressed full and in this respect she differed from the others. How was it with her descendants? Two gen-

erations later, a heifer gave milk continuously for a year and eight months and I had to put her in the barn and feed her straw and poor hay for ten days, in order to dry her up two months before dropping her second calf. The trait of holding out has been handed down from generation to generation and the heifer that seemed to be so inferior was really equalled by only one of the others. The two heifers with the best pedigrees proved to be the best cows. I once sold a bull to W. B. Bartlett, of Eagle Point, Wis., combining the blood of one cow giving twenty-one quarts milk per day, of another giving twenty-two quarts and this strain remarkable for holding out, two of the three being very rich milkers. What effect this blood will have upon his herd, time will tell.

One heifer, when she had been milked only two weeks, would make a noise similar to the one she makes when she calls her calf, whenever she heard the pails rattling against each other as they were brought to the barn. She had learned that the milker relieved her udder and she was milked immediately after the pails were brought in, and she had associated the sound with what followed. A daughter of this cow does the same thing, not when the pails come but when she sees the milker standing near her with a pail, for she is not milked till near the last. This indicates intelligence. The other cows do nothing of the kind and the younger must have inherited the intelligence from the dam. This is certainly not a case of imitation, for the older one was sold a year and a half before the younger dropped her first calf. Both are very gentle and like to be

petted and I find the children in this heifer's stall, but in no other. When the cows go to pasture, this heifer keeps in the rear and the children walk beside her with one hand on her back, and they say her calf must not be sold, although they say nothing when the other calves are crated and sent away.

Enough has been stated without taking more space, to show the reader why pedigree means very much more to me than it did when I began the breeding business a dozen years ago. There are exceptions to all rules. I gave away a heifer from my best cow, when she was more than a year old, because I considered her worthless, and I do not think she has more than paid for her keeping for the four years she has been giving milk. But in nine cases out of ten, my best heifers are from the best cows and from the cows that have a long line of good cows for ancestry.

CHAPTER XII.

KICKING COWS.

In the preceding chapter, mention is made of a very nervous cow noted for her excellent dairy qualities. She would usually stand still to be milked and she was the only cow on the farm that had the privilege of running loose in the stable during the winter. The story told us was that when young she was fastened with a "bow" made of elm the same as others, but she struggled so long they feared she would break her neck, and my father decided to let her have her own way to save her life, and during my day neither halter nor hand ever touched her except when she was milked. She would not attempt to run away, but stand in the open yard or in her pen in the barn as well as the other cows that were fastened. The only trouble we had was occasioned by chapped teats which she had during the windy months of spring.

With her, kicking was no great effort, for she was naturally quick motioned and you might as well attempt to dodge lightning as a blow from her foot. Just one stroke and over would go the pail and, perhaps, the milker. To confine her by head or foot was considered out of the question, for, as far as I know, no spot on the cow was ever touched except her teats, and the way they got her accustomed to being milked, was by letting the calf suck the cow according to the custom of

those days, for two months or more, and while the calf was sucking one side, some one would milk on the other side. To deal with such a cow would tax the ingenuity of the greatest writers upon dairy topics. The means used to prevent her from kicking were very simple and very effective, and were probably never tried on any other cow since the days that Adam and Eve milked in the Garden of Eden. Before I was large enough to milk, it was often my business to control this cow so that some older person could do the milking. This seems almost like the peaceable times coming, mentioned by Isaiah, when the wild beasts would be so quiet, "that a little child shall lead them." I stood beside the cow with a big club raised over my shoulder, while the eyes of the cow "would roll out like peeled onions," as we used to say. The club was never used and, while I stood there in a threatening attitude, the cow never moved a foot no matter how sore her teats were, and the only wonder is that she never held up her milk. Whether this method will work as well on other cows, farmers can best find out by trying.

The next kicker was a heifer, descended from this cow and she seemed to inherit all the kicking blood, but only a part of the butter blood. Milking may be done very well if a cow kicks occasionally, but this heifer kicked all the time. Some farmer told us to buckle a strap around her body in front of the bag. This had precisely the same effect it would have to tie a string around her tail and no more. We finally succeeded in controlling her by milking with the right hand and with the left reaching in front of one leg and

taking hold of the cord above the gambrel joint on the other leg. This was slow and laborious work, and not for years afterwards did I learn to use a better method. We now have a strap made similar to a hold-back strap in a single harness, but six inches longer. Put this twice around each hind leg above the gambrel and buckle. The heifer will struggle, but she can neither injure herself nor the milker. As I am always at home when the chores are done, training heifers has always been my work and for years this strap has been used on every heifer, and I sit down and milk the first time with both hands and often continue to use the strap for two or three months and the result is, I never have a kicker in the herd, unless some cow happens to have sore teats.

Shall we feed a heifer grain to take up her attention while we are milking? This is a good practice with both cows and heifers for a few days after the calves are taken away, as this will prevent their holding up their milk. In a short time, hay may be substituted for grain and no hay will be needed after a week. It is not desirable to have cows form the habit of eating while you are milking, for in summer it is not always necessary to feed, and very many farmers would condemn the practice of feeding at the time of taking away the calves. I consider it necessary, for holding up milk is very common at that time, and, when a cow does this once, there is great danger that she will do it again until it becomes a fixed habit. A few years since, I was buying milk of a man to ship to Milwaukee. Being rather short at one time, he said: "I will bring you milk enough tomorrow night, for four calves are sold

and going away tomorrow." The next night came and he brought only the usual quantity and gave as a reason that none of those cows would give any milk. Now, when four cows will do this, it indicates that this is a general practice among cows to hold up their milk when calves are taken away.

In 1887 a widow had two cows and wanted to sell me one of them. As she offered me the best one, the bargain was soon completed and I drove my cow home. She was then five years old and to appearance one of the finest cows in the neighborhood. I found that she would fill a large pail with milk twice a day, under favorable circumstances, but when anything happened to disturb the cow at milking time, she would hold up her milk and put one foot in the pail in "the twinkling of an eye." On the whole I was not remarkably well pleased with my purchase, but had no idea of losing so fine a cow without making an effort to conquer her. A cow that will hold up her milk and is a desperate kicker besides is very undesirable property to own to say the least. I kept that same cow five years and after I had a fair chance to put my thinking powers against hers, she neither held up her milk nor did she kick. I conjectured that under her former owner when she began to kick, some feed was brought to take up her attention and without this feed she would hold up her milk. A heifer can be trained in almost any way, but this cow was too old to learn new tricks, and when I was ready to milk, I gave her bran or some feed that she could not eat rapidly and put on the strap previously described. At first there was quite a struggle over the

strap and one or two loops were broken off. She finally gave up the struggle. In winter when we were feeding ensilage, we always saved her's until milking time and by letting the cow have her way about feed, she concluded to let me have my way about the strap, and, during the five years we owned her, there was not a nicer cow to milk in the barn. She would never raise a foot nor did she ever hold up her milk, and if you have a cow that kicks or holds up her milk, you can take a similar course, or sell her for beef. After a cow is five years old, it is not easy to break her of bad habits; there is only one thing that will make any impression—cultivate her forgetfulness. I give a cow feed when her calf is taken away, so that she will forget her calf for the time being and in the same way, while the cow is satisfying her appetite she forgets to kick or hold up her milk, the strap was only used as a means of safety in case the forgetfulness was only partial. A cow can neither kick nor hold up her milk without the exercise of will-power. Give her chloroform and this will-power becomes dormant and she will be quiet. Have you ever read before of using an animal's forgetfulness to accomplish a desired purpose?

Any nervous cow may at any time form bad habits. I had milked a cow for four years and she always gave down her milk. One summer I hired a boy, who was in a hurry to get through with the milking, for he knew this was the last work of the day. Once or twice, in my absence, he milked this cow, and he complained that she would give scarcely any milk. The cow began to hold up her milk with me in the same way, and for

years I was obliged to give her feed to work upon the nerves of forgetfulness until I had finished milking. Most farmers want to hire fast milkers, but with me the fastest milkers have invariably been the poorest. Retaining part of the milk will always dry up a cow, and when a cow gives but little milk, it is only a gradual, slow process that will draw it all out. Inventors may work upon milking machines for a hundred years and they will learn that a calf is the only machine that will be a success with all kinds of cows. One man owned a large farm and kept fifty head of cattle and got along well enough with one hired man, by letting the calves do the milking. This custom may spoil the cows for hand milking, the only question is whether it pays better than the old way. Where there is a local demand for fat calves that will dress 250 to 300 pounds each and young calves can be purchased for \$1 per head, veal farming may pay better than anything else. To get the net profits upon a cow, we must deduct the cost of feed and labor. When the labor is very little the gross income may be small and still give a fair net income.

CHAPTER XIII.

CROSS BULLS.

Of all the breeds of cattle now kept in the United States, the Jerseys are famous for furnishing the greatest number of vicious bulls. Since 1881, I have had one or two Jersey bulls to take care of, and they have often been kept till they were six or seven years old, thus giving me an opportunity to learn their nature and the best method of handling them. The first one I had to deal with, had been led by snapping a rope into the ring in his nose until he was past three years old. In this way he had been handled to put on the cars and take to the State Fair at Madison when he was two years old. He was so well trained that no staff was considered necessary, for there was no more trouble in leading him than in leading a horse. Something happened when he was three years and a half old, that taught me that it is never safe to depend upon training and education to make them safe to lead with a rope and no staff.

I had fenced a small pasture with barb wire on purpose for a bull pasture. When the fence was completed, I was leading the bull along and a hired man was leading a younger one, or rather the bull was leading him, and I was watching and laughing at his maneuvers, when suddenly he turned the laugh on me, for

I found myself prostrate at the foot of a tree. I was so busy watching the performance with the other bull that I was not moving quite fast enough to suit my bull, and he came up behind me ram fashion and knocked me out of the way. The blow was severe enough to knock me off my feet in an instant, but I had sixty rods more to lead him before reaching the pasture, and I never thought of giving up the job on account of being knocked down. By keeping my eyes on the bull and using a small stick I had in my hand, I finally reached the pasture without any further trouble, and I learned a lesson which I have remembered ever since. A bull, like a gun, becomes dangerous when carelessly handled, and as large a proportion of gunners are killed every year as of bull tamers. In one case, we say it is carelessness, in the other bulls are dangerously animals.

To draw the danger line, it may be stated that it is unsafe to allow a Jersey bull to run in the pasture after he is two years old. He should be kept in a pen made especially for the purpose. I have a pen unlike any other, which is safe for the man who takes care of the bull and is a great improvement on those generally used. There is an extra slide door on the inside four feet high and made of plank. It is impossible for him to break through this and the only precaution necessary is to fasten it so he cannot slip it and that part of the pen is completed. At the opposite end there is an arrangement for feeding and watering. Posts are set up with an opening in the middle large enough for a bull to put his head through, and fourteen inches in front of the opening stands a wide plank which will prevent him

from getting his body through the opening and it leaves room to set a large pail for watering also for putting in feed. This pen has been used for seven years and found to be perfect in every way. When we wish to clean and bed the pen, we give the bull feed and fasten him with rope and snap, or the opening might be made like a stanchion and whenever he puts his head in for feed, it will be easy to secure him.

In this pen we kept one bull never cross, but so fond of play that it was unsafe to take him out and lead him with rope and staff as we can most bulls. He had a habit of whirling around all the time and getting down on his knees and trying to make a dive at you. It was easy to hold the forward end, but the hind end would describe the arc of a circle. He was easily handled by taking a pan of oats and calling him up to the plank door just described. After getting a snap into his ring, one man held him while the other blindfolded him which we often did by putting a cotton jacket over his face and fastened by putting his horns in the armholes and tying the sleeves under his throat and buttoning the other part around his nose. In this way he was perfectly helpless and as easy to handle as a calf. By building a strong yard thirty feet square outside the pen, it would be easy to handle a cross bull without taking him out. With feed call him up to the fence and secure him, always reaching for the ring slowly instead of the usual way, which is with a quick grab, always frightening the bull and causing him to jump backward and pull on the ring, hurting his nose so much that it soon becomes difficult to catch him. In this way a bull

can be handled with perfect safety, since there is always a plank fence between him and the attendant, and while one holds him another man can enter the pen for any purpose necessary. This yard will furnish the bull room for exercise, a very important consideration, and if not over-fed he may be kept till ten years old or more. The famous Pedro cost the owner \$10,000 and was kept till he died, at the age of eighteen years.

It is the custom to dehorn bulls, but I never even thought of it and I would never do it under any consideration for fear of affecting the nervous system and at the same time make the attendant careless. H. S. Weeks tells a good story on himself. One day he had some visitors and took them to the barn yard to see his Jersey cows. A large bull was running loose with them and he was telling them how the bull was so cross before dehorning that it was hardly safe to enter the yard, "but now," he added, "I am not afraid of him." Just then the bull made a jump for him, and, if Mr. Weeks had not quickly jumped one side, he would have been crushed against the barn. This is the old story about the gun: "I didn't know it was loaded."

Now if a bull ever gets loose and tips over a wheelbarrow and upsets things generally, do not get excited, but drive your herd of cows where he is, and the mischief is over. We once had a case of the kind, and, by turning two cows out of the stable, he was captured within ten minutes. This was done without danger by shaking a pan of oats while there was a good fence between us. Get a bull accustomed to this way of feeding grain to him when he is young, and he will generally

come for the feed; if not, another man may drive all the cattle near the fence and we never have one that fails to come a short distance when called. Should this fail in any case, drive all the cows into the stable and it is very easy to secure him, by reaching for the ring in his nose when he does not notice you. Occasionally, this ring is broken and a new one must be put in. To do this when he is in a pen, throw a long rope over his horns and run this over a pulley fastened overhead and draw his head near the side of the pen and as high as possible. Secure the other end of the rope by winding around a post and it is very easy for two men to put a ring into any bull's nose, provided there has been one there before. To put one in for the first time, when very large, would be an undesirable job. We put in the rings when they are a year old by fastening them in rigid stanchions and pulling the head one side with a rope around the horns. When a man saws off the horns, he must find some way of his own to secure an old bull for inserting the ring. A bull must never be hitched with a rope in the ring, when he is outside of his pen, for sometimes he will pull the ring through the flesh. I saw one bull that had done this and another ring was put in above by turning it at right angles to the first one.

Finally, never train a bull nor give him any advice, but as far as possible let him alone, unless you have a tread power, where you can sober him. An ox can be trained when he is constantly in the yoke, but to train a bull handled but little, only irritates him and makes him worse instead of better.

CHAPTER XIV.

RAISING CALVES.

There is a general complaint among dairymen throughout the country about losing calves when they are small, and I take up this subject more especially to discuss this unnatural condition of affairs. The following extract is from an editorial in *Hoard's Dairyman* of May 14, 1897:

CALF MORTALITY.

The readers of *Hoard's Dairyman*, are not the only people who are afflicted with the loss of young calves. Scarcely one of our exchanges comes to hand without one or more reports or inquiries on this subject, and all containing evidence, that the disease is equally as baffling to the veterinary profession, as to the owners of the stock. The weight of opinion, just now, seems to incline to the theory, that the cause of the disease antedates birth, and is due, either to the food of the dams, or to the contaminated atmosphere they are compelled to breathe in the close stabling of winter.

The situation is certainly serious enough to demand the attention of our experiment stations and agricultural and veterinary schools. We do not know of anything more disheartening, to the breeder and dairy-

man, than these matters of abortion and mortality among calves; but so far as public information goes, they are receiving little or no close study, from those to whom we have a right to look for information.

Having been through similar trials myself, I know how to sympathize with those in trouble if I am unable to suggest any remedy or method of prevention. From one Jersey cow I have lost three calves from scouring. She is a very rich milker and belongs to a rich milking strain. Her daughter tested 8.2 per cent. butter fat seven months before calving. I easily found a way to prevent scours, although it was several years before I could get any idea of the cause. The first calf from this cow lived only two days. Others lived several weeks, but finally went the same way. Later I took the calves away from the cow when they were twelve hours old and gave them half new milk and half skim-milk for two weeks and gradually changed to skim-milk and boiled flax seed. I gave them only two-thirds as much as they seemed to require and this small quantity of weak milk was easily digested, but when a calf sucks very rich milk from the cow and takes all he can hold, indigestion and scours are sure to follow. Many farmers begin to feed oats to young calves, but I would never do it before they are a month old. Milk and hay seem to make healthy calves and the growth can be attended to when their digestion becomes stronger. There are many ways of spoiling a calf's digestion. Besides the ways mentioned the most common is to feed milk too

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warm or too cold. Either of those will ruin any calf although some breeds of calves will live through more hard usage than Jerseys. For four years after I began to breed Jerseys, I lost one-fourth of the calves by scours. Not being accustomed to rich milker, I did not quickly catch on to the cause of the trouble and it seems now that some one might have told me many things which I have been compelled to learn by experience. My losses from scours amounted to several hundred dollars, but for several years I have not lost a single calf that way.

When a calf gets the scours from any cause, every farmer has a sure cure. Among the many remedies may be mentioned: Lime water, flour, browned in oven; eggs, boiled milk, castor oil, red pepper, ginger, brandy, ess. of peppermint and tinct. of rhubarb mixed in equal parts. With me the most of these remedies failed in severe cases. It may be advisable to mention some of the ways that have worked the best. A calf should always have access to fresh dirt and get some exercise, then if there is a mild case of scours, scald the milk and mix a teaspoonful of castor oil and as much ginger. While conducting a great many experiments, I once hit upon a novel cure. I was once reading in Ayer's Almanac that the pills advertised were made from an extract of castor beans, and I dissolved one pill and used it instead of the castor oil and it seemed to work better in the cases I have tried. There is a root of a plant that grows in all parts of the country, that is a sure cure for the worst case of diarrhoea in man or beast. This is such a powerful astringent that I hesitate about recom-

mending it, for an over-dose might prove fatal.

For years I have not used any of the remedies mentioned, but have used a very effective prescription which I intended to publish, but I find it is a private formula and the man who originated it considers it his property, and does not like to make it public.

If there is anything more dangerous than scours, it is constipation. I lost several calves mysteriously and found upon examination that this was the cause. It is easy to prevent this by putting a small quantity of boiled flax seed in the milk and a very little salt.

In regard to the great loss among calves at the present time, the remark in the extract given that "the cause of the disease antedates birth," seems to be the true explanation of their dying so quickly after they are dropped. When my cows aborted, a part of them carried their calves the full time and then the calf was dead or, in some cases, lived only a few hours. For two years a cow in my herd has dropped a dead calf and I anticipated the same trouble this spring. For a month during the winter I gave the cow a small teaspoonful of phosphate of lime, daily, and I have never seen a calf with more vim and vigor. There seems to be a lack of some material for manufacturing healthy calves, and experiments along this line can do no harm.

The suggestion in regard to the "food of the dams" may have something to do with it. Avoid bran with black specks or middlings that taste bitter. It seems to be the custom of millers to grind screenings containing cockle and mix it with other kinds of feed. I consider cockle very dangerous feed and there is a machine

that will separate the cockle from the wheat, but why should a miller throw away what he can sell for \$6 to \$10 per ton? The only way to keep this dangerous stuff out of the feed, is for the farmers in the wheat region to sow nothing but clean wheat and use every means possible to get rid of the cockle.

We publish the following from Country Gentleman:

CALVES WASTING AWAY.

Eds. Country Gentleman:—Last spring I began raising three of my calves, one bull and two heifers. After about three weeks we commenced feeding them skimmed milk and oil meal as directed by your paper. They were fed this and did well as long as they would drink the milk. I had gradually worked them on to whole oats, shorts, bran and oil meal, hay, fresh-cut corn fodder, with plenty of ears, and they seemed to be doing finely up to the last of September, when they seemed gradually to go down, refused their food and lost rapidly in flesh. Their bowels seemed to be regular. I gave them an appetizer, but it seemed to have no effect. One heifer lingered along, and got so weak that she could not get up. I knocked her in the head and put her under the sod.

In two or three week the bull died of his own accord. After death his eyes sank way back in his head. I got our local veterinarian and had him examine him. He pronounced his stomach and bowels normal, lungs slightly affected and liver rotten, as he termed it. With light pressure, you could push a stick through it any-



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Owned by Smiths and Powell Co., Syracuse, New York.

where. The gall bladder was as large as I ever saw on a full grown beef.

The third one is still alive, poor as wood and has no appetite; picks a little at hay and corn fodder, and possibly eats a handful of grain twice a day and about the same of sugar beets. Her bowels are a little inclined to be constipated, but I think she inherits this from her mother. I have given her a drench three times; salts, molasses and ginger, but does not seem to be of lasting effect. Eyes bright and seems to feel good, and I think drools a little at mouth; does not cough. I don't think she eats any more than my fall calves. Their ancestors are all well and healthy. Have you any hope of the calf, or would you advise killing her?

These calves were kept up in barn all summer, as advocated by your best writers, and windows darkened in fly time.

H. B., Orleans County, N. Y.

I had a similar case in 1895 and two more in 1896. The first year I finally killed the calf, having no idea of the cause. The past season one of them was so bad, recovery was impossible, as it had wasted to a mere skeleton with plenty of feed and drink. And right here is the cause of the whole trouble, in my case—they had too much drink. A calf forms the habit of drinking all the milk you give whether it is too much or too little, and when water is substituted for the milk, he does the same thing, provided the water is given him in a pail. On one of the neighboring farms a boy carried water to a calf, supposing it to be very thirsty, and the calf drank so much that it killed him. I have had bulls

after they were grown up that would drink all right at a trough, but would drink from a pail as long as you would carry water.

Now, in the case of these two calves the last season, I conjectured they had had too much water. This dilutes the gastric juice of the stomach so that the food is not well digested and of course the body is not properly nourished, and the natural result is, the animal wastes away. In the extract given, it states that the calves "seemed to be doing finely up to the last of September." This statement is consistent with my theory. Considerable water would be required while warm weather lasted, but, by continuing the same quantity of water during the cool weather of October and the following months, the farmer undoubtedly ruined the calves. I gave the calf that was reduced very much, but still strong, one-half as much water and this one gradually improved, but has not yet fully recovered. Temperance people may learn that water as well as whiskey may be used in such a way as to be destructive to animal life. The only two suggestions that I can make is that in weaning calves they should have a chance to get what water they require from a trough instead of a pail, and that they should have some corn meal mixed with the other feed while they are getting milk and after they are weaned. Whenever they seem to be getting too fat, stop feeding corn meal. A calf raised for the dairy should never be fat or too much of the feed may be used for making tallow, instead of butter after the calf becomes a cow.

CHAPTER XV.

GARGET.

The following extract is from the Country Gentleman:

Caked Udder.—A cow came in about two months ago; did well, but now one-quarter of the bag is hardened, and that teat is nearly dry; yet gives a little milk. Cow is perfectly healthy to all appearances. I have had considerable trouble with my herd in this line and believe it to be a bag difficulty, but am not successful in my attempts to overcome the same. L. B. J., Ketchumville, N. Y. [Give 2 oz. spirits of turpentine and 1 1-2 pts. raw linseed oil. Next day give 2 oz. spirits turpentine and one-half pint linseed oil. Rub quarter with some of the following lotion a day: Aqua ammonia fort., 2 oz.; linseed oil 4 oz.; spirits of turpentine 4 oz.; vinegar, 1 qt.; mix. Feed bran, ground oats, hay and corn fodder. Allow no other food for two weeks. Report in a week and refer to this page.]”

The disease described is very common and in the first stages is not difficult to overcome. Take a piece of poke root in bulk about equal to a hen's egg and cut in small pieces and feed by putting inside a potato, or when green it may be scraped and mixed with liquid and given from a bottle. Another way is to feed with

meal a spoonful of salt peter every morning and a teaspoonful of coperas at night.

In one very obstinate case, when the bag was so caked that the cow seemed to be ruined, a cure was effected by using beans boiled without changing the water and mixing one quart with feed twice a day. In case of swelling of any kind, there is nothing better than bean poultice made by cooking beans in the same way.

A CHILL.

Sometimes in hot weather a cow will come from the pasture shivering as though she had been out in a cold rain storm. This indicates a diseased condition of the blood and is a symptom of garget and is usually followed by caked udder. In case of a chill without apparent cause, give some of the remedies first mentioned, but if there is a chill from exposure to a cold storm, put in a warm stable, rub well and cover with blankets. Give a dose of whiskey, quinine and ginger. A much better way is to avoid the chill by keeping cattle in the barn even in the middle of the summer, when there is a cold rain. Years ago I knew a cow to die from exposure to a heavy rain one afternoon. At night she was put in the stable shivering and nothing was done for her but to fill the stable with cattle and close the doors. This was in the month of June and it would seem to be a sure way of generating heat, but there was a loft over the cows' heads for feeding and the wind sucked down over the cattle and this cow did not get warmed up and died two days afterwards with all the appearance of

milk fever, although this was eight months after calving.

Nearly five years had passed and I had met with no losses from milk fever and was beginning to think the disease was conquered, and I had no fears of any more cases, when suddenly a new disease, very similar, appeared. Writers upon farm topics have not divided these into two classes, but have considered them the same, and I may properly give the points of difference as they appear to me:

1. Milk fever may be avoided by preventing impaction of the manifolds, keeping the bowels loose and drawing all the milk for a week before calving.

2. Milk fever occurs only at the time of calving.

3. Heifers under four years do not have milk fever.

4. Milk fever usually follows heavy feeding.

5. In a case of milk fever a cow may be down three or four days and recover.

6. With milk fever the stomach and bowels are affected more than the brain.

With the other disease, which we will call a chill, the usual precautions for milk fever amount to nothing, and we will write out the points of difference in order, and ask a comparison.

1. In case of a chill, drawing the milk before calving and keeping the bowels loose will have no effect. In one case the milk was not allowed to accumulate in the bag, and the cow had two quarts of oats mixed with a pint of whole flax seed twice a day. With wheat bran half a pint of ground flax seed and a little salt were

mixed and the bowels were loose and moved after the cow was down and unable to rise.

2. A chill may kill a cow months after calving, although it requires more exposure to cold or storm than at calving time.

3. A heifer two years old would be as likely to die from the effects of a chill as an old cow.

4. A chill will kill a cow no matter how poor her feed, but it may require more exposure with a poorly-fed cow than with one highly fed.

5. In case of severe chill at calving time the disease is incurable and the cow will die within twenty-four hours from the time she falls. When the chill is only slight, we sometimes read how cows have been saved by covering them with steaming ensilage or horse manure. Any veterinarian can prescribe remedies to be taken internally to assist in starting the perspiration.

6. In case of chill the brain appears to be affected more than the bowels. The eyes soon become glazed, the throat paralyzed and death soon puts an end to the most intense suffering.

A change in circumstances brought me cases of this kind, but the trouble stopped as soon as I had time to ascertain the cause. There was a stable where two horses usually stood which was used for cows at calving time, provided it was not very cold. This was large and airy enough so that it was not necessary to open doors or windows and a cow was pretty well protected from the wind. A new floor had been put in this stable, made of plank run through a planer and,

being slanting and of course wet, it was too slippery to use for cows. A new place had to be found, and one night in April when the weather was mild, a cow was put in a pen covered with marsh hay. There was a special arrangement to prevent wind from entering between the sides and roof, and the pen was double boarded with building paper between and had a good floor. Now, who would wish for a more comfortable place for a cow in April when the severe weather was over? One morning we found a calf in the pen. The cow was chewing her cud during the day and seemed to be doing well. As it would be less trouble to me, I decided to let the cow remain with the calf during the night which proved to be very windy. The protection from wind was sufficient for that season of the year, except in one place. A horse had once been kept in the same pen and had eaten a hole through the marsh hay in the roof. Corn stalks had been thrown over which served to darken but did not exclude the wind like fine hay. During the night the cow was badly chilled and in twenty-four hours was dead. Even in a good stable where many head of cattle are kept, warm weather may make it necessary to open windows, and a change of temperature and wind may result in the same loss. Hence, a stable which has but few animals in proportion to its size had been my choice for cows when they must have air, but be kept from the wind. I have thus given a case in detail, hoping others may learn how to avoid similar losses.

CHAPTER XVI.

SMALL PESTS.

Of all pests that we have, the chinchbug has done the most damage in the West. The following is from the New York Tribune:

"FIGHTING THE CHINCHBUG.

"This pestiferous, ravenous bug destroyed more property in the United States during the season of 1896 than would be required to buy Cuban independence.

"I am not prepared to say whether its ravages have been greater or more extensive during 1896 than during the preceding seasons, but I can say that the farmers are beginning to realize that its inroads upon their crops must, in some way, be checked, to prevent the shrinkage whose absence would often place the balance upon the right side of their ledgers. And they are co-operating with the experiment stations in endeavoring to find the best method of extermination.

"All, I think, of the barrier methods have been used in this country with poor success, and I am convinced that the best of barriers will not protect a field for more than a few minutes. Many advise digging post-holes in the trenches every few rods, under the belief that the bug once in the trench will march up and down the trench, in the manner of breachy stock trying

to find a gap in the fence, and will fall into the holes and be easily destroyed.

This is erroneous, or, at least, very uncertain, for they turn only to something green and palatable. When reaching the barrier they immediately begin an ascent of its walls, and, though they fall back many times, they are persistent, and will finally reach and scale the top. Tar and salt, kerosene and salt fences are soon covered with dust, and the bugs cross over undisturbed."

The writer states further that he has little hope of exterminating them except by spreading disease among them by "placing diseased bugs here and there among the well ones in the field," but admits that he has had very poor success with his experiments thus far.

In 1889 I first had some corn destroyed by chinch-bugs which came from a neighbor's field of barley. I had just moved into a new locality and had never seen them before and did not know anything of their habits or how to fight them. The next season I sowed Hungarian twenty rods from a field of barley. When the barley was cut the chinch bugs marched across a piece of plowed ground and began upon the hungarian and had destroyed a strip a rod in width when I discovered them, and, anticipating a complete destruction of the field unless something could be done speedily, I concluded to ask advice of a man who lived in the vicinity and who knew how to deal with them better than I, for he had been among them twenty-five years. He visited the field and said they were so thick they would be likely to destroy the entire crop and nothing could be done to stop them. I started for home and concluded

to let the bugs have everything their own way. A week later I returned to the field and found they had advanced only a few feet and had got their wings and scattered over the entire field, but in their winged state they proved comparatively harmless and I had a good crop of hungarian on the field excepting a narrow strip. Then and there I determined to fight them the following season by feeding them. I sowed a strip of hungarian between the corn and barley, and before they had eaten all the hungarian they had reached maturity and scattered and the corn escaped. Mr. F. P. Hartwell of Summit Center, Wis., had for several years lost four acres of corn out of twelve and I suggested that he try the new way, and he reports that he sowed a strip ten feet wide with hungarian and the bugs took that and one row of corn and stopped. The strip was seventy rods in length and he thinks six cents per rod, or \$4 20, would cover the cost of seed, labor and rent of land.

This method has probably never been published and now for the first time I publicly recommend it and ask all who try it to report the result. The new fence is cheap enough and would never be likely to fail unless in a very dry season when hungarian would make but a small growth.

LICE ON CATTLE.

Take equal parts of lard oil and kerosene and put in a handful of sulphur into a quart of the mixture. With a shoe brush rub this over the animal until the hair is moist but not wet. Repeat in three weeks.

LICE IN THE HEN HOUSE.

Put one teacupful of crude carbolic acid into two gallons of kerosene and sprinkle around the house, and late in the afternoon use a sponge on the roosts and the offensive odor will drive away or kill the lice on the hens. The nest boxes must be well washed with the same.

TO AVOID POTATO BUGS.

Plant late potatoes June 1. This worked well in 1896. No bugs appeared in the field during the season. In 1897 the spring was very cold and the bugs put in their work later and there were a few which were killed by using Paris green applied with a broom brush instead of sprinkler, requiring one fourth the water and one fourth the work.

CHAPTER XVII.

CONVENIENT BUILDINGS.

A man's success in handling cows depends very much upon having convenient barns. My barns were built to suit some one else. Had I money to build them over I think I would save half the work during the winter. As I have never seen nor used my kind of a barn, I cannot tell how it would work and I have concluded to pass over the subject with a single remark: I would never tolerate a horse barn nor a cow barn with a ditch for the stock to walk over.

When building a new house do not forget the kitchen. A farmer's wife spends the greater part of her time in the kitchen and only one house in a thousand has a kitchen built for summer use. To have it cool, it must not be put in one corner of a large house but must be built beyond the main part at least twenty feet long with a stove in one end and two windows on each side near the middle and opposite end so to give a free circulation of air through the rooms without danger of cooling the oven too much when baking. We have such a kitchen with a dining room at each end and you can always feel a breeze passing through the room which would be impossible in a kitchen with another room on one side.

Hard and soft water must be provided without the necessity of going out summer or winter. We have a

refrigerator costing \$2.50 made by lining the under part of a cupboard with zinc and inserting a small tube for an outlet through the floor. We never elevate the ice but drag it in on the floor and let it be in the lower part with slat shelves over it. Confine the air around the ice and you will have a box of the same temperature whether the ice is high or low.

If you have no ice, take a large butter jar or new sewer pipe and dig a hole in the bottom of the cellar large enough to admit which ever you choose to use and cover well. You will then have a cellar beneath a cellar and many degrees cooler than the upper one.

CONCLUSION.

Many subjects have been omitted to give space for other writers. A few points have been given about the care of cattle. Let the reader remember that a little knowledge is a dangerous thing. There are hundreds of times in a man's life when he can afford to use and pay for the knowledge of an expert rather than use his own. A horse is cut in a barbed wire fence, or slips a stifle out, a cow runs down to a skeleton, or perhaps gets choked and in such cases the chances are against you for you have had little experience. I know of one farmer who sent eight miles for a veterinarian to relieve a choked cow, and in that way undoubtedly saved her.

The reader will find much in this little book that does not suit him, and those who would like to give the writer information upon any subject, are invited to write him and he will take pleasure in correcting at

some future time any statements calculated to mislead. Only by studying and comparing notes can we hope to ever find the truth.

One chapter was prepared on hard times, but we pass it over with one statement: In the early part of the present century a woman used to spin wool, using the large wheel which most of us have seen. A week's wages amounted to fifty cents in specie and board. A day's work was five skeins of 660 yards each or 16,800 yards for fifty cents and board and nobody had then heard of "low wages" or "hard times." Those who have seen a woman at work at her spinning wheel can understand that she took a great many steps for a cent. In those times you might look in vain through a town-ship for a piano, organ or covered carriage.

THE BREEDING OF GUERNSEY GRADES.

BY W. D. RICHARDSON, GARDEN CITY, MINN.

I say *Guernsey* grades, and I do not say it thinking that there are no others, because there are tens of thousands of farmers in this broad land who would do well to breed grades of *any improved breed of cattle* instead of the horde of unprofitable scrubs they persist in perpetuating. But I say Guernsey grades from knowledge and experience in breeding and handling them by the side of grades of other breeds. I say Guernsey grades in preference to Short-Horn grades because they are very much more profitable in the dairy, in fact, my attention was called to their excellence by comparison with Short-Horn grades. The first two Guernsey grades I had, grew to be two-year olds and came in at about the same time. At about the same time I also had four grade Short-Horns come in, the S.-H.'s were four and five years old. These six stood in a row together and it occurred to me to have the milk of the two put into one can and that of the four into another, and when it came to the churn the two two-year olds made more butter than the four four and five-year olds and besides the butter of the first was yellow and that of the others white. You will pardon the digression if I tell you that at the test at the Chicago Exposition the Guernsey men used no artificial coloring in their butter. Both the other breeds did, but the Guernseys received no credit for their ability to color their butter.

I will also tell you that I sent butter for the gold medal competition sending one package each month for four months, the butter had *not a particle of artificial coloring in it* yet I have two of the score cards in my possession marked by the judge *two points off on color* with a written line "*too much coloring in it.*" I received a gold medal for butter just the same. I say Guernsey grades instead of Jersey grades because I have found them to be of better size, have better constitutions, better and more evenly quartered udders, and better teats. I have also found them much *better tempered*. I have bred and handled about seventy-five Guernsey grades and have never had a nervous or vicious one. I say Guernsey grades instead of Holstein grades because I can get something back for my feed.

In starting to breed Guernsey grades I would say use the best selected *native cows* as your foundation cows. If you use grades of any other breed let them be Jersey grades as they will blend and harmonize better than any other I have tried. The Holstein cross is too violent and is not satisfactory. The Short-Horn cross is better than the Holstein but still is not as good as that with the native. In using my improved grade you have to antagonize one blood against the other. You will not breed up as rapidly and you are far more liable to bring out undesirable traits of some ancestor on one side or the other. With the native the impressibility of your Guernsey sire is much more apparent. Although you will find some native cows so strong that they will transmit their own color for two generations. Select your cow carefully, keeping those that give a

reasonable flow of milk for a long time rather than those that give a large flow for a short time and go dry a long time. Then weed out the ones you keep, keeping those whose milk is richest. One of the greatest disappointments met with in breeding from native cows, is their lack of ability to transmit any good qualities they may possess. For instance, you may take two cows, one a good deal better, individually than the other, and breed to the same sire. The poorer individual may be far more impressible than the other. If so, her offspring will be very likely to resemble their sire and if heifers make much better cows than those of the better cow which resemble their dam, I would say that in a bunch of heifers of equal value in regard to form and general indications for dairy cows, that it is always safe to keep those resembling the sire. Do not expect everything from the first cross. You will find your heifers resulting from the second cross much superior to those from the first, and this will be especially true if they are bred in, that is, breed the sire to his own daughters. Of course, if you should have one or two that were not vigorous, do not breed them in, but all that are all right should be so treated. This brings us to the consideration of the sire. Some one has said that a good sire is one whose daughters are equal to their dams and a great sire is one whose daughters are very much superior to their dams, and Mr. J. H. Walker says that "no man can estimate the difference between the best and next to the best." Don't think that because you only want to breed grades that you can afford to buy an inferior bull. Above all things, don't think

of using a grade. Whenever it is possible to do so, I would advise the buying of a sire that had been tried and that had shown that he was a sire of good cows with good shaped udders and good, well shaped teats, no matter if he should happen to be 6, 7 or 8 years old. Rightly used he will be useful for several years. In selecting a younger bull, get one with good head, good lung and heart power, good barrel (long and deep) cut well out behind. See that he has four good sized rudimentary teats and that they are well apart. See that his milk veins are long and that he does not stand too high from the ground. Do not use him any more than is absolutely necessary as a yearling. He will be enough better afterward to pay for it, and do not let him run with the cows and use himself up five or six times as fast as he should.

I have already made this longer than I expected to. If it is rambling and disjointed, you can lay it to the fact that I have not had much experience in writing for publication. I will close with a few tests taken as the cows stood. The first group was taken in May and the last in October. I have no memorandum of how long they had been in milk, but they were all *half-blood* heifers. (4.75, 4.70, 4.61). (5.5, 5.7, 5., 5.2).

SYRACUSE, N. Y., July 2, 1897.

MR. N. B. WHITE, Oconomowoc, Wis.—DEAR SIR:—Your favor was received a few days since, and certainly your proposition is a most liberal one—much more so than we could have expected, and we feel almost as if we were intruding upon you to offer anything from our herd for publication.

We will, however, send you a half-tone from a photograph of Sir Netherland Clothilde, 8517, which bull at present stands at the head of our herd, and which we believe to be one of the best specimens of the breed. He is not only making a reputation in the show ring, having several times been shown at the New York State Fair, and has several times taken the First Prize in his class, but has also taken Sweepstakes over all bulls of all ages; has stood at the head of the herd that won the Gold Medal; his produce has taken First; his daughters have won First in their various classes; his sons have also been awarded the highest honors, and in fact, we believe no other bull has ever made such a showing, but his most valuable characteristic is the milk and butter production of his descendants. Fourteen of his daughters, at two years of age—all that we have milked through the year, have made records which average for the whole number over 10,000 pounds per year, and butter records which average over 12 pounds per week, and the test for pure fat, by the Babcock Tester, showed an average of over 4 per cent.

His get are exceedingly uniform, and of the type of the sire.

In breeding he contains 75 per cent. of the blood

of Netherland Prince, which bull was especially noted on account of the butter qualities of his daughters. The other 25 per cent. of his blood is largely of the Clothilde stock.

This cross of the Clothilde and Netherland Families has produced the finest show animals in the "Lake-side" Herd, and as producers, they have been second to none.

We also send a half-tone electrotype of Netherland Monk's Aaggie Constance, 20556, taken at four years of age.

This cow as a two-year-old gave 62 pounds, 6 ounces of milk in a day; 11,201 pounds, 7 ounces in a year, and made 15 pounds, 8½ ounces of butter in a week. As a three-year-old she made 20 pounds, ½ ounce of butter in a week, and gave over 12,000 pounds of milk in a year. As a four-year-old she gave over 14,000 pounds in a year.

Her dam, Aaggie Constance, commencing at 26 months of age, gave that season 16,761 pounds, 11 ounces of milk in a year—her highest day's yield being 76 pounds, 6 ounces. As a six-year-old she made 19 pounds, 14½ ounces of butter in a week.

Netherland Monk's Aaggie Constance was sired by Netherland Monk, a son of Netherland Prince, and whose dam, Albino 2d, stands ahead of all cows of her age in production, having given as a two-year-old 16,484 pounds, 13 ounces of milk in a year, and on her fourteenth month in milk, at that age, made 13 pounds, 14¾ ounces of butter in a week. As a three-year-old she gave over 70 pounds of milk in a day, and made 25 pounds,



"AGGIE."

MILK RECORD 18004 LBS. 15 OZ. IN ONE YEAR.
Owned by Smiths and Powell Co., Syracuse, New York.

14¼ ounces of butter in a week, and 106 pounds, 14 ounces in 30 days.

The old cow "Aaggie" 901, we presume will be familiar to most of your readers, but as no cow had a greater reputation, at her time, and very few have done so much for the reputation of the breed, we send you a wood-cut, made by Palmer, and showing this cow in her prime, six-years-old, at which age she beats the world's records, by giving 18,004 pounds, 15 ounces of milk in a year.

She stood at the head of the Aaggie Family at "Lakeside," which family probably has produced as many great cows as any other family ever known.

Aaggie 2d, a daughter of this cow, surpassed all two-year-old records by giving 17,746 pounds, 2 ounces of milk in a year. As a mature cow she gave 20,763 pounds, 3 ounces in a year, made 26 pounds, 7 ounces of butter in a week, and 304 pounds, 5½ ounces in 90 days.

Aaggie's 2d daughter, by Netherland Prince, when but 25 months old, on winter feed, without any grain, having only ensilage and hay, made 15 pounds, 1 ounce of butter in a week.

Neptune, a son of Aaggie, was the sire of a large number of heifers which at two-years of age, made records ranging from 10,000 to 12,000 pounds in a year, and quite a large number of them, at from two to five years of age, made butter records ranging from 12 to 24 pounds in a week.

As an evidence of what can be accomplished in a single herd, by perseverance in testing, and breeding

for a specific object, we will say that in the "Lakeside" Herd since its foundation over one hundred cows and heifers have made yearly milk records which average over 15,000 pounds, and the same number have made weekly butter records which average about 20 pounds.

Among these would be included such cows as Clothilde, which at six years of age gave 26,021 pounds, 2 ounces of milk in a year; Clothilde 2d, at four-years, 23,602 pounds, 10 ounces in a year; Lady Fay, five years, 20,412 pounds, 3 ounces in a year; Aaggie Rosa, seven years, 20,225 pounds, 3 ounces in a year; Netherland Belle, four years, 19,546 pounds, 3 ounces in a year; Albino 2d, two years, as given above; Aaggie, six years, 18,004 pounds, 15 ounces in a year; Aegis 2d, seven years, 17,943 pounds, 2 ounces in a year; Netherland Consort, five years, 17,673 pounds, 9 ounces in a year; Aaggie Cornelia 3d, four years, 17,350 pounds in a year; Addie, eight years, 17,164 pounds, 15 ounces in a year; Netherland Dowager, ten years, 17,190 pounds; Aaggie Idaline, seven years, 17,129 pounds, 7 ounces in a year; Careno, five years, 17,103 pounds, 15 ounces in a year; Aaggie Rachel, five years, 17,073 pounds, 7 ounces in a year; Lady Griswold, seven years, 17,023 pounds, 7 ounces in a year; Valley Beauty, six years, 17,009 pounds, 8 ounces in a year, etc., etc., and cows with the following butter records: Clothilde 2d, eight years, 30 pounds, 8 ounces in a week, and 320 pounds, $1\frac{3}{4}$ ounces in 90 days; Clothilde, eight years, 28 pounds $2\frac{1}{4}$ ounces in a week; Albino 2d, three years, 25 pounds $14\frac{1}{4}$ ounces; Aegis, thirteen years, 25 pounds, $13\frac{1}{4}$ ounces; Bonanza Maid, five years, 21 pounds, $3\frac{1}{2}$ ounces;

Idene Roeker, five years, 25 pounds, $3\frac{1}{2}$ ounces; Netherland Peeress, 25 pounds, $\frac{1}{4}$ ounce; Lady Griswold, nine years, 25 pounds, 14 ounces; Netherland Dorinda, eight years, 24 pounds, $9\frac{1}{4}$ ounces; Clothilde 4th, three years, 23 pounds, $10\frac{1}{4}$ ounces: Aegis 2d, six years, 23 pounds, $7\frac{1}{2}$ ounces; Aaggie Beauty 2d, five years, 25 pounds, $5\frac{3}{4}$ ounces; Cocelia Rooker, four years, 22 pounds, $13\frac{3}{4}$ ounces, etc., etc.

Do sire and dam transmit butter qualities to their offspring? All breeders who have carefully investigated the subject will answer this inquiry in the affirmative, and as an evidence we will refer to a few of the Holstein-Friesian cows and families with which we are familiar.

Netherland Prince was a marked example of the influence of a sire upon the butter production of his daughters.

Eight of his daughters—one two-year-old, five three-year-olds, one four-year-old, and one five-year-old—made weekly butter records which averaged 20 pounds, $3\frac{1}{2}$ ounces; while twenty-five of his daughters—the majority of them being two and three-years-old, made weekly butter records which average over 15 pounds; and twenty-eight of his grand-daughters—over three-fourths of them being but two-years-old, made weekly butter records which average 14 pounds, $11\frac{1}{2}$ ounces.

Sir Netherland Clothilde, which contains a larger per cent. of the blood of Netherland Prince than any other sire, had fourteen daughters tested in the two-year-old form, whose weekly butter records averaged over 12 pounds.

Clothilde, the founder of the Clothilde Family which has done so much for the reputation of the breed, the winner of the butter prize, over all breeds at the great New York Dairy Show in '87, making a butter record of 28 pounds, $2\frac{1}{4}$ ounces in a week, produced seven daughters in succession, five of which were tested for butter—three of them at three-years of age, and the average of the five, with the dam, 22 pounds, 15 5-6 ounces of butter in a week, and 16,809 $\frac{1}{2}$ of milk in a year.

Jacob 2d, probably the most noted bull of the Aaggie Family ever owned in Holland, had a wonderful influence upon the future of the breed in this country. A large number of his daughters were imported, and nearly everyone proved to be superior. Eight of his daughters made yearly milk records which averaged 16,231 pounds, 5 ounces, and the same number made weekly butter records which averaged 20 pounds, $1\frac{3}{4}$ ounces.

This is a marked instance of the effect of a superior sire in transmitting his dairy qualities to his offspring.

Many more instances could be given did space permit.

Very truly,

SMITHS & POWELL Co.

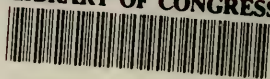
INDEX.

	PAGE.
Abortion.....	35-46
Breeding Guernsey Grades	111-114
Calf Mortality.....	92
Calves Wasting Away.....	96
Calving Time.....	28
Chill.....	100
Chinch Bugs.....	104-106
Convenient Buildings.....	108
Cross Bulls.....	87-91
Drying Up a Cow.....	27
Early Customs.....	5-9
Feeding for Size.....	60-65
Garget.....	99-101
Guernsey Grades.....	111-114
Heredity.....	73-80
Holstein Cattle.....	115-121
Keeping Cows Clean.....	68-71
Kicking Cows.....	81-86
Lice in the Hen House.....	107
Lice on Cattle.....	106
Loss of Cud.....	32
Medicine.....	32
Milk Fever.....	10-26 101-103

Placenta.....	30
Potato Bugs.....	107
Potatoes, How to Feed.....	33
Raising.....	92-98
Scours in Calves.....	93
Silo.....	47-59
Small Pests.....	104-107
Smutty Corn.....	42
Value of Different Kinds of Feed.....	66-67
Water Supply.....	72



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