

# **THE COW**

## **IN HEALTH AND DISEASE**

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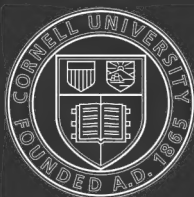
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# THE COW

## In Health and Disease

*Embracing the Fundamental Principles of Sanitation and Hygiene—The Proper Care and Treatment in All Common Diseases—The Care of the Dairy and Dairy Products, Including Municipal Requirements and Standardization.*

BY

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This volume is dedicated to those who have the best interests of the cow at heart, both from a humane and economic standpoint, and who are desirous of doing all that they possibly can to add to their comfort and protect their health.

BY THE AUTHOR.



## PREFACE.

From the author's experience as a practicing veterinarian in the rural districts and from the reception of his articles pertaining to the cow by the readers of the largest and most influential dairy and farm papers in the United States he was convinced that there was a great need for a book dealing with the proper care of the cow in health and in sickness.

The aim of the author in preparing this volume was purely an educational one and it is hoped that none of its readers will be led to believe that he desires to impress upon them the fact that they can successfully and profitably prescribe for their cows during sickness, but rather that realizing the nature of those conditions that commonly affect their cows that they will whenever possible secure professional aid. To be forewarned is to be forearmed, and truly the cheapest thing that you can purchase when you have a valuable cow sick, is the advice of a reputable veterinarian.

If the author is successful through the medium of this volume to enable some few owners

of cows to prevent their animals from suffering from many of the loss-producing ailments that are mentioned herein, thus aiding in the production of those food products that are so essential for the maintenance of the general public, then his purpose will have been fulfilled and his work well done.

The author is especially indebted to all those parties who have contributed their encouragement and support and to the Burton Publishing Co., whose aid has been almost invaluable.

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## CHAPTER I.

### HOW TO PRODUCE CLEAN MILK.

What a wonderful thing a beautiful and useful theory is when it can be applied in a practical way. How many times, however, have results obtained greatly and positively exploded the necessity of some of our best theories. We feel that the government score-card for the inspection of dairies is an ideal system when it can be used as it should be and when the results are all that can be obtained by its use. In practice, however, it requires more than conformity to given regulations, in many cases, to obtain desired results. Especially is this true of the dairy business. You can furnish a dairyman with an equipment that conforms to the score-card of the United States Department of Agriculture, and still his neighbor across the road who can not produce milk to meet the Federal score-card test is producing a much better grade of milk than the former. Clean milk depends upon the individual and not upon his equipment.

It is a good thing to have buildings and

equipment to conform with the regulations that have been worked out by the United States officials, but too many times the equipment is considered all that is necessary to produce high grade milk. Thus, many men who really are producing a high grade of milk are receiving no more than any one else, and men with good equipment are producing a much inferior milk and receiving the price that really should go to the other man. We have always felt that it is an unjust discrimination against many dairy-men to prohibit them from competing with other men who maintained a more elaborate and expensive equipment. It seems to us that quality should govern the production of market milk in all cases.

### **Good Features of Score-Card.**

Enforcing the score-card system of inspecting dairies has some very good features to commend it. It enables the producer to produce good quality milk with less labor and at less cost than with less complete equipment, and beside the esthetic effect on the individuals that consume the product has some little bearing. You will agree with me that milk that is produced from a dairy where all of the buildings are neat and well kept, the cows are clean, all the attendants are dressed clean and everything is spick and span, will appeal to most individuals as just the kind that they desire, while it may not be nearly so wholesome or

free from dangerous disease germs as that produced by his neighbor just across the way who does not have such extensive equipment or make such a pleasing appearance. While horse meat may be almost if not altogether as palatable as beef, yet most of us would hesitate or even refuse to eat it simply from our esthetic feeling toward it.

The Federal score-card calls for a perfect score of 100—40 to the equipment and 60 to the methods. From the reasons just given and from results actually obtained, we feel that it would no doubt be better if a much larger total, say 80 or 85 points, be devoted to methods. For after all, a perfectly equipped dairy with faulty methods will not produce a high grade market milk, and hence we feel that even more stress should be laid upon the methods.

### Health of Cows.

The first thing under the methods in the dairy that should receive attention should be the health of the cows. Since we know that tuberculosis is so common among dairy cows and that many cases of tuberculosis among infants are contracted from infected cow's milk we feel that no one should be allowed to offer milk for sale for human consumption unless sure that the cows that produced it are free from tuberculosis. Cows that are affected with other contagious or infectious diseases such as leucorrhea or whites, or cows with one

or more quarters affected with garget, can not be expected to produce a clean milk. The first and most essential thing is to get a clean bill of health for the cow that is secreting the milk, as it is impossible to get clean, wholesome, germ-free milk from a diseased cow.

After the cows have been found to be healthy it then becomes the duty of the dairyman to keep them healthy. Here is where education and instruction along sanitary and hygienic lines may do the most good. Any inspector of dairies should make this one of his chief aims—to point out to the man who has cows under his care the relation of sunlight, fresh air, good feed, regular feeding, cleanliness and exercise to the health of his cows and the economic importance of observing these necessary rules for maintaining the health of his cows. This should be just as much the duty of an inspector as the scoring of the methods and equipment of the dairy. As soon as a man learns definitely that unhealthy cows will not yield a profit, he will refuse to keep them and you will have then done more real good and accomplished more through educating this man than you would ever have accomplished through compulsory legislative procedures.

#### **Dairyman and His Employes.**

Many times we wonder whether or not a closer attention to the dairyman and his employes would be productive of much more good

than could possibly result from the inspection of his equipment. The dairyman must know that cleanliness of his cows, the utensils in which the milk is handled and of the persons handling it must be observed. He must bring himself to realize that milk is one of the most easily contaminated foods that we have and that a matter of a very short time is sufficient for contamination to take place. He must be educated into seeing that carefulness, cleanliness and speed in handling milk will go a long way toward eliminating many of the causes of an impure product. A man can keep his utensils clean, can keep his cows clean, and can keep himself clean in very ordinary surroundings, and for that reason we contend that the equipment has very little to do with the quality of the milk. It is the methods that count. Whenever you find a man who has good methods about the dairy, you can overlook the equipment and say to yourself that there is a man who is producing good milk.

### Grading Suggested.

Since it is first-class quality milk that is desired we can not see why a systematic plan of grading milk could not be worked out and successfully applied. Of course, this would make necessary a great deal of laboratory work, and such tests would need to be made at intervals that would allow the laboratory worker time to test all the samples under his supervision.

The time at which the tests should be made could be determined by the one doing the testing and it would possibly be best not to inform the producer as to when this test was to be made.

Such a test should include butter-fat, content of solids not fat, total solids, a bacterial count, a sediment test and keeping qualities. A standard could be determined and a sliding scale of prices could be paid for the milk according to the test that it might show. We think that such a test should be made of a composite sample or samples of milk from each dairy no less than four times during the year. It might be advisable under certain conditions that might arise from weather conditions or other local conditions to make the test oftener than this. By making such a test, all producers of milk are on an equal competitive basis, but as long as the equipment and methods are placed first and quality last, many men are being used unjustly and many others are receiving what should justly belong to some one else.

This would also be the fairest of all systems for the consumer and also the most economical as the consumer would then pay for only what he got and no more. We can hardly understand why any producer of milk would object to this unless it should be some one producing milk of such poor quality that it was barely slipping by the present regulations and under

the suggested regulations he would have to sell his milk as of such poor quality that he would get less than now. I am quite sure that the majority of dairymen would welcome such a method.

We can hardly see why such work as this could not well be handled by the Federal government, the same as they are now performing the systematic inspection of all animals killed for food purposes at the slaughter houses that do an interstate business. If the Federal government performed this inspection they would be enabled to work out a better and uniform system, on account of the many experts that they already have and due to the fact that they would have much larger fields in which to work out their plans. They could and would, in most instances, secure more competent men to do the work, as they would no doubt secure them from civil service examination. As they would have the entire country to draw from, pay good wages and exempt the positions from political interference a better class of men would seek the positions.

### Average Inspector.

The average inspector is very unpopular with most dairymen and there are several reasons for this. In the first place, too many inspectors are inspectors in name only and do not have the ability that one should have to perform such duties. They lose favor with the

dairyman because they place so much importance upon minor and unimportant matters, at the same time overlooking things that are really important. The practical dairyman is quick to see such mistakes. Also, too many inspectors seem to think that the score-card is all there is to the inspection of a dairy and after that is done their work is ended. A successful inspector must know something about cows, more than he has read in books.

Too many of our inspectors are city boys who have taken a veterinary course; then gotten "just such a job." Very few of this class meet with the approval of the men among whom they work. An inspector must not be arrogant and ready to show authority at every turn, but must bring the dairyman to realize that he is working for his best interests and that he is always ready to give any advice that might help in any way. It requires an abundance of tact and judgment to perform such duties intelligently and effectively.

In many towns and cities you will find lay inspectors with no training of any kind but who secure their positions through politics. Such positions are worse than useless and should be abolished at once as they do much more harm than good, as very few individuals will permit without much resentment, such individuals to have authority over them. We feel that men should be especially trained and qualified for dairy inspection work. When



we have worked out a satisfactory plan that is fair to both the consumer and producer and have men who can really do the work as inspectors that they should do and as it should be done—then we feel that the milk question will be on a somewhat more solid foundation than it is at the present time.

## CHAPTER II.

### HOME PASTEURIZATION OF MILK.

For large children and adults the following method may be used. Take a small pail and get a shallow pan such as a pie tin and punch holes through it and place it in the bottom of the pail. This leaves a space between the bottom of the pail and the bottom of the bottles and allows of a free circulation of water. Punch a hole through the cap of one of the bottles and insert a thermometer. Use one with the scale etched on the glass as they are more accurate than the ordinary floating thermometer, and then place water in the pail almost to the level of the milk; the pail should then be placed over the flames and heat until the thermometer registers 155 at which time the bottles should be removed from the water and covered with a clean towel and allowed to stand from 20 to 30 minutes. Place a new cap on the bottle with the punctured cap or cover by inverting a cup. Then place in a pail of warm water and add cold water until there is no danger of breaking the bottles from the

cold then place in refrigerator and keep cool using as soon as possible.

In pasteurizing milk for babies it is well to use the nursing bottles, as this saves a great deal of work and danger of contaminating the milk from handling. Take as many nursing bottles as there will be feedings and it is good policy to have an extra one as one often gets broken, and if they have no seals, plug with ordinary cotton and the thermometer may be held in one of them by the cotton plug. Place over the fire and heat until the thermometer registers between 145 and 150 degrees, and then remove the bottles from the fire and insert the thermometer in the water which will be found to be much higher in temperature than the milk, and add cold water until the water is from 145 to 150 degrees and then cover with a clean cloth and let stand 20 minutes. Then cool with water to ordinary temperature and then pack broken ice around the bottles and place in the refrigerator until ready for use, when it may be warmed to the required temperature. If the milk is fed in a modified form this should be done before it is pastuerized. If the bottles are warmed and not used, the milk should be thrown away.

## CHAPTER III.

### THE NEED OF MUNICIPAL MILK INSPECTION.

Milk and meat as foods have received much more consideration at the hands of investigators as food products, because they are used as food by many more people than any of the other food products, and because milk is primarily a food for the young. Cow's milk is especially much used in the cities as food for the babies, where many of them are bottle fed. It seems to me that the procurement of a wholesome and pure milk for the people, and one that is cheap and nutritious, for the people of our country, and especially for the babies, would be a work in which any one should feel proud to be engaged and should receive more consideration at the hands of veterinarians than it does. Too many of us veterinarians do not pay any attention to matters of this kind simply because our municipalities do not make provision for such inspection. Milk not only carries disease to the

human family, but it decomposes very rapidly; and, besides, there are many people who are so unscrupulous as to adulterate it in various ways. By careful observations and tests, methods have been perfected by which these frauds may be detected.

It was formerly thought that anything to be of any value concerning the public health must come from the regular medical practitioner, but the recent advances in comparative pathology and therapeutics have taught the people that the individual who has had special training along such lines is the individual that is best prepared to handle the situation, and for this reason the veterinarian is better fitted to handle the inspection of milk than any other because he has had special training in the diseases of the domestic animals and diseased conditions that may result from the consumption of some of their food products.

In the production of milk for human consumption, the very first act is a violation of Nature's law. Nature intended that the young of those animals who nourished their young with milk should draw the milk directly from the udder. Milk in being drawn by hand or any other artificial means for the use of those who may use it for food is sure to undergo more or less contamination; the dirt and bacteria on the teats, the loose hairs on the body, the dandruff from the skin, the particles of dust in the air from dusty fodder and hay,

and several others all contribute to contaminate milk when it is artificially drawn for human consumption. The time elapsing between the drawing of milk and its consumption and the rapidity with which it develops bacteria make it necessary to use the utmost precaution in handling it. When calves are fed on milk, artificially drawn from the cow, the contamination, decomposition and irritant properties that develop oftentimes prove dangerous and many times fatal because of the gastrointestinal conditions which they cause. Infants often suffer with this same condition, and in the cities where bottle-fed babies are common, from 10 to 20 per cent of the infant deaths are from this cause alone. In one of the large cities of this state where they have had competent and rigid municipal milk inspection, during the first three years infant funerals were reduced  $33\frac{1}{3}$  per cent, some record to be proud of, we should think.

The stalls where cows are kept should be cleaned some time before milking, so that the cows may be well bedded down and the dust have time to settle and the odors to banish; the attendant who does the milking should not smell of the odors of other farm animals with which he may have been working and should wear clean clothing and should have clean hands. It is a common practice with many milkers to go to milk without washing and then wet the hands with the milk during the

milking. This is very unsanitary and should be discouraged. The cows should be cleaned before milking and the udder wiped with a damp cloth; the opening in the top of the pail should be as small as possible to permit milking, as this will keep much dirt from getting into the milk; the pails and vessels in which milk is handled should be so constructed that the milk can not collect around the seams and thus be a breeding place for bacteria that are usually associated with milk.

It is the large dairies that furnish milk for the people in the large cities, and it is in these large dairies that the cows are forced for a large milk production, and for this reason they are not able to withstand disease as well as they would under more favorable conditions, and therefore the milk from such cows and the cows themselves should be under competent inspection.

Cows that have diseased udders are sure to give off some of the infection when the milk is drawn; also, in diseases where the other eliminating channels are not working properly, infection and poisonous products are sometimes given off with the milk. We feel that many of the diseases of infants in particular are due to some infection in the milk, especially where they are fed on cows milk, due to streptococci and other virulent strains of infection and their poisonous products.

The reason milk is not recognized as the

cause of more of the ailments of children, than it is, is due to the fact that there are too many doctors who do not make enough effort to find the cause of many of these conditions, being very willing to call them summer complaint, indigestion, etc.

It is a recognized fact by a large number of the best authorities on medicine at the present time that bovine tuberculosis may be, and in fact is, transmitted to human beings through the milk of animals infected with this disease; this affects children under two years of age principally, although older children and occasionally adults contract the disease in this way. Dr. Park, an eminent physician of New York City, is authority for the statement that the bovine type of tuberculosis is the cause of the death of two to three hundred of the infants in that city each year; a mighty hard blow to the mothers of New York to bear for a condition that could be remedied.

Great care should be taken in the production of milk, so that the attendants who care for the cattle do not infect the milk with various diseases with which they may be associated, or be the virus carriers for them. Many times people have been infected with typhoid fever, scarlet fever, diphtheria, etc., simply through the milk that they have consumed.

The water in which the utensils are cleaned should be pure and free from any diseases that



might render the milk dangerous to public health.

The time elapsing between the drawing of milk and its being consumed by our city cousins in many instances is several hours, and this makes it all the more necessary to have a system of inspection that will compel the producer to make the necessary provision for the proper delivery of his product to the consumer.

There are several methods used by those dealers who have no regard for fair dealing in adulterating their products, and where inspection is maintained these frauds can be detected and the person punished for so doing. These consist chiefly of artificial preservatives and flavors; and watering is quite a common practice in some places in this country.

Many of the conditions mentioned in this chapter could and would be greatly benefited by competent municipal inspection, and several of them could be eradicated, and by so doing would be a great protection to the people of the municipality.

## CHAPTER IV.

### MILK FOR INFANT FEEDING.

While milk is naturally a food that is primarily intended for the feeding of the young of all the mammalia and the human family it does not always hold that the young, especially the babies, receive this article of their food just as they should. We know that the milk from a good healthy mother is the best food for the infant, but, for many reasons, it is not always possible for mothers to nurse their babes, and, for this reason, it becomes necessary for them to do the best they can under the existing conditions, and so they are compelled to resort to artificial feeding and cow's milk is the food usually selected.

In procuring cow's milk for the baby, it is necessary to violate nature's laws, as nature intended that the young should draw the milk directly from the udder, but it is necessary to draw the milk from the cow artificially and then deliver it to the baby. In the cities, this takes several hours and, as milk is very prone to decompose, it is plain that great care must

be exercised in handling it. Milk for infant feeding or for human consumption should be produced from healthy cows. They should not have diseased udders. They should be kept under sanitary conditions, and they should have plenty of fresh air and sunlight. They should be kept clean and the region of the flank and the udder should be washed with a damp cloth and dried before milking, as this prevents any dandruff or loose hairs or other dirt from falling into the bucket while milking. The attendant who does the milking should have clean hands and wear clean clothing while milking, and should not be around people infected with contagious diseases, such as diphtheria, typhoid fever, smallpox, or other such diseases.

You have a perfect right to demand this much of your man who sells you milk and more, too. The milk should be cooled to 50 degrees or less as soon as possible after it is drawn, and kept at that temperature until it is marketed. The vessels into which it is drawn and in which it is stored should have no seams around which the milk might collect and decompose. In the cities which have a provision for inspection under competent veterinarians these matters will all be attended to; if you have not this sort of inspection, now is the time to advocate it, and do not give up until you have secured it.

Not all the fault lies with the dairyman, however. Many people do not care for their milk properly after it is delivered to them. Milk

should be placed in a sterile container, away from the sunlight and dust, and in a place having a temperature of 50 degrees or under is still better. Do not place it in an ice box having a bad odor, as it will usually absorb much of it. Heat favors the growth of bacteria or disease germs, and, as there are many in the milk at all times, it is necessary to keep milk at a low temperature to keep them from developing.

Pasteurized milk is the best for infant feeding. The aim in pasteurizing milk is to kill as many of the bacteria as possible without producing a chemical change in the milk. It has been determined that during this process the temperature should not exceed 185° F., nor fall below 140° F. To pasteurize milk in the home, it can be done by placing the milk in airtight bottles or in bottles which have been stoppered with sterilized cotton and immersed in hot water and heated, say at a temperature of 149° F. for one-half hour and then rapidly cooled to 50° F. or less; or heated to 167° F. and kept at that temperature for fifteen minutes and then cooled as before. It is now possible to obtain pasteurized milk in almost all of the larger cities, but then the milk should be properly cared for as if plain market milk. It is best usually to pasteurize your milk that you use at your own home. Sterilized milk is milk that has been raised to the boiling point to destroy the bacteria in it. This can only be successfully done by heating

the milk to the boiling point on several consecutive days. It is not good for infant feeding, as it produces a chemical change in the digestive ferments of the milk.

Certified milk is that which is certified to be of certain standard. It is guaranteed to be up to the standard which may be set by the city or the dairyman himself. This kind of milk is very safe.

Modified milk is prepared especially for infants. In cow's milk you will find more protein and less milk sugar, and it also has larger fat globules, and there is more casein in proportion than there is albumen. The deficiency in milk sugar can be remedied by adding milk sugar or rice flour, or arrow-root. The casein may be rendered more easily digested by the addition of lime water. Most infants will thrive on modified milk when the whole milk is injurious to them.

Homogenized milk is milk that has been forced through capillary tubes with great force against a resisting surface with sufficient force to break up the milk globules, thus producing a more perfect emulsion.

There are many infant foods, some of them containing the nutrients of milk, and some that do not. But there are some of them good and useful, and others that are dangerous. If it is absolutely necessary to resort to artificial feeding it is best to consult a physician before using a prepared food.

## CHAPTER V.

### KEEPING THE COW WARM.

We were just wondering how many farmers, stockmen and dairymen ever stop to think of just what effect cold has upon the animals under their care.

The proper housing of animals of all kinds and especially milch cows, will greatly lessen the amount of food that they must necessarily consume, as when they are kept in cold barns, that have draughts and cold floors upon which the animals must either stand or lie, for the animal must use much of the feed that is consumed to produce warmth for its body. The cow that is kept under such conditions or under conditions where she is subject to sudden and great changes in the temperature, will not produce nearly as much, as though she was kept in a nice warm barn, and could use this feed that would be used to produce warmth, for the production of milk instead.

The drinking of cold water, especially by

cows, has much the same effect, and water that is given cows in the winter time should if possible, be heated to around fifty degrees Fahrenheit. Cold water occasionally causes colic in cows, especially in the winter season. Anyone can well afford to provide a means of heating the water for the cattle to drink and also provide a warm comfortable barn for them during the winter months, as the saving in feed and the increase in production of milk and of fat in those that are not milking will soon pay for the cost of securing the same.

The feeding of frozen feeds has much the same effect as the drinking of cold water and is very apt to be injurious to those animals that eat it and for that reason no careful and conscientious feeder of cattle would think of feeding his farm animals frozen feed.

Don't forget that a nice, warm, comfortable stable is a good investment and is absolutely necessary if you would derive the profits from your cows and other farm animals that is possible and that a heater for your watering tank is another good investment.

## CHAPTER VI.

### KEEPING THE COW CLEAN.

There are many reasons why cows should be kept clean. Not only should they be kept clean so that they will remain more healthy, but it will be a very important factor in producing clean milk.

The stall where the cow is kept should be well bedded with straw, so that the cow will keep herself clean and to lessen the risk of becoming sick from lying on the cold damp floor.

The cow that is kept clean and free from dirt will not be so apt to become diseased as the cow that is allowed to become dirty and remain that way. The skin has a very important function to perform in maintaining the health of the cow and can only perform this function when it is kept free from dirt and filth.

The skin excretes a large part of the waste products from the body through the moisture that passes from the body by way of the skin, and helps maintain the body temperature by



cooling the blood that passes through the skin, where it becomes cooled and when it reaches the internal parts of the body it keeps it at a uniform temperature. The extra feed that will be required for the cow that is kept unclean will be of more value than the time and expense of keeping her clean.

The cow should be curried and brushed at least once each day and if she gets dirty in such a manner that it can not be brushed off then she should be washed and dried with a coarse cloth. Where electricity is available and the number of cows will warrant the expense an electric machine may be procured for cleaning the cows. It is very easily operated, saves time and is very satisfactory.

### **Construction of the Barn.**

The first thing to be thought of in constructing the dairy barn, is the health of the cows, as cows that can not be kept healthy are being kept at a loss and besides the products that are secured from them are dangerous to those who consume them. The things that are necessary for keeping the cows healthy are plenty of air space as each cow must have plenty of fresh air at all times, so the barn should be so constructed as to provide 1,000 cubic feet of air space for each cow. The next thing is plenty of light as cows kept in dark stables do not produce well and besides they are not easily kept sanitary, as sunlight can not get in its work, therefore

there should be four square feet of light for each cow.

Cows that are uncomfortable are not able to produce as much as they otherwise would, therefore the stalls should be of sufficient width and length that the cow will be comfortable when lying down, but only of such length that the droppings will fall into the manure pit and not upon the floor where the cow will become soiled. The size of the stall will vary some for different sized cows. A very large cow needing a floor about 5 feet 2 inches long and 3 feet wide, while a smaller cow will require one about 4 feet 6 inches long and 3 feet wide. The stanchion should be of a swinging variety so that the animal can get its head in a comfortable position while lying down.

The ventilation is one of the most important things to be considered as it is absolutely necessary to change the air and have it replaced by pure fresh air at frequent intervals, if we would keep the cows healthy. The ceiling should under no consideration be too low.

The barn should be constructed of material that can be thoroughly and easily cleaned and thoroughly disinfected. For this reason concrete and steel have become much more popular in the construction of dairy barns than wood. The cow barn should be located where the drainage is good and away from any out-buildings that are apt to give off an offensive odor.

There should be no high sills where the cows must step over them or they may injure their udder in this way.

An up-to-date cow barn should contain one or more large box stalls for cows that are calving and one or more calf stalls, where the calves may be kept after they are weaned.

Up to the present time concrete or brick are much more satisfactory for the floors of the cow stable than wood and is used in almost all new stables that are being built now. They last much longer, require very little or no repair and can be easily and thoroughly cleaned and disinfected.

### **Equipment of the Dairy Barn.**

Several firms make a special equipment for the cow barn and this equipment is made of steel. This is practically indestructible, is neat in appearance, but very little more expensive than wood fixtures, more compact, easily cleaned and kept clean, is not injured by dampness or disinfectants and is much more sanitary.

The stanchions are usually swung from both top and bottom by a short chain and this gives the cow much comfort when eating and while lying down. The feed troughs are so constructed as to be easily cleaned and being tightly constructed they eliminate the waste of grain and semi-solid foods.

One of the latest as well as one of the best

of the modern fixtures that may be found in the cow barn is the individual watering trough or bowl which is kept partly filled with water at all times and is so constructed that the water flows into it as it is being consumed by the cow and remains at a given level. This enables the cow to have water at any time she may wish it.

During the summer months if the cows are kept stabled the placing of screens over the windows and doors will pay for themselves several times over in increased production.

## CHAPTER VII.

### CLEANING THE BARN.

With the increase of contagious and infectious diseases among people and live stock, and since so many diseases are transmissible from animals to human beings, it becomes necessary to take all practical and useful precautions to guard against such conditions.

Cities and municipalities are everywhere realizing the importance of maintaining sanitary surroundings for their citizens and have officers that look after this line of work. They are a great help to any city, and in fact are a necessity in any city of a few thousand people. No city could profitably dispense with this important officer. There is no reason why such an officer would not be able to do a great deal of good among the rural folks by educating and instructing them concerning the many advantages of keeping the farms as free from diseases and as clean and sanitary as possible.

Of late years many of the animal diseases have been steadily increasing, such as tuberculosis,

contagious abortion, and hog cholera, and others. Thorough sanitation would greatly lessen the frequency of these diseases and stop the spread of them. These diseases are causing the farmers to lose millions of dollars each year.

The general condition of many farm buildings makes it next to impossible to render them sanitary to any degree worthy of the name. The floors of many stables are worn and contain large cracks through which the manure and urine pass and in which countless varieties of disease germs are to be found. Since cement has become so popular as a building material, it greatly assists in maintaining sanitary surroundings for the farm animals, as nearly all the floors of barns and stables are now made of concrete, and in cow stables and hog pens it is possible to use the iron fixtures that make it convenient to do a thorough job when disinfecting and cleaning the building.

In cleaning up the stable all the trash should be removed from the manger, the bedding removed, and the dirt and cobwebs swept from the sides and ceilings. If the floor is of cement you can use a bichloride of mercury solution on the floors and a hot lime wash on the stalls and mangers, or a carbolic acid or coal tar disinfectant. The harness may be disinfected with creolin or some coal tar disinfectant, but do not use the bichloride of mercury solution. The same procedure can be carried out in the cow stable. If it can be made air tight, you may use one pound of permanganate of potash to 20 ounces

of formalin for each 1,000 feet of space. The permanganate should be placed in a metal vessel and then set in a metal tub partly filled with water, then the formalin should be poured in with potash. The operator should not be long in getting away from this solution as it produces a very strong gas that is very hard on the eyes; it should be watched through a window or crack for a few seconds to see that it does not take fire. The building should be closed for 24 hours.

One ounce of bichloride of mercury to 8 gallons of water is strong enough to kill any of the disease germs when used in sufficient quantities. Care must be taken as it is very poisonous. Creolin or any of the coal tar disinfectants should be used in about 5 per cent solution of water.

Take about 100 pounds of quick lime and 60 pounds of water and slack it, this forming hydrate of lime; of this take 1 part to four parts of water, which should be hot, and after straining apply with a spray pump. One pound of the chloride of lime to every three or four gallons greatly increases its value.

## CHAPTER VIII.

### THE AVERAGE FARM COW.

In our work as practicing veterinarians we see almost all kinds of cows—that is, the kind that are kept by the average farmer. It may seem absurd, but we believe that there are few farmers who really give very much thought or attention to their cows. The reason that most farmers keep poor cows is that they do not have any idea what the cost of the production is. They figure only the amount of production. We firmly believe that more than 50 per cent of farmers' cows are boarders. We can not understand why farmers do not keep accounts and find just where they stand. It is poor business to keep live stock that does not pay, yet that is just what many farmers are doing in the richest section of Ohio, and in all the other states, for that matter.

Many farm cows are existing at the expense of some of the other live stock on the farm. The failure of the average farm cow is not always her



fault. The best cow will not be a good investment if she does not receive good care and proper feeding. The average farmer pays too little attention to his cows; usually he just throws the feed into them and lets them take care of themselves.

One of the greatest crimes against the cows is the utter disregard of breeds. We find cows that are inbred and others that have 2 or 3 crosses to other breeds; frequently these crosses are antagonistic to each other. It seems that most farmers breed to the bull that is handiest, regardless of his individuality or breeding. No attention is paid to conformation. These mongrel bulls or barnyard lunkheads are losing the farmers of the United States vast sums of money each year.

In many sections farmers are beginning to breed for better animals. It does not matter so much whether the farmer keeps all purebred stock, but he should always strive to breed for those characteristics that go with the particular kind of animal that he wants. Personally, we would rather have an extra good individual that was not purebred than a purebred that was lacking in many of those characteristics that belong to its kind. The immature and small cow is often kept for breeding purposes just because her dam was a good cow. This should not be done, as often this poor individual is the result of mixed breeding.

The average cow is fed on the coarsest of roughage, with very little grain. Usually the

grain is corn, which is not even ground. One can not expect a cow to go through a winter in good shape and produce a good quantity of milk on such feed. Many are now feeding silage and this is helping them out of their difficulties. Such feeds as linseed meal, cottonseed meal, bran, roots, alfalfa and clover hay are proper for the cow.

Many of the cows on the farm are kept in an open yard without any shelter at all, and others are kept in a shed full of cracks through which the winds blow over the animals. The stanchions are either too short or are so long that the animal must lie in the filth and dirt, many times without bedding of any kind. The surroundings of cows have a great influence upon their production.

## CHAPTER IX.

### HOW TO SELECT A GOOD COW.

The business of dairying has rapidly become commercialized during the last few years owing to the competition. While prices for dairy products have increased in value during the last few years they have not increased in value in the same proportion that labor and feed have increased. For these reasons it requires a skillful business man at this time to milk cows at a fair profit.

The average farm cow has a very poor chance to return a profit to her owner, from the fact that she is usually improperly fed. She is often kept in a cold, dark, damp stable that is poorly ventilated, and she is fed largely roughage with very little grain and no concentrates. It is estimated that there are twenty-two million cows in the United States and that of this number only about seven million are returning a profit to their owners, but by good care and proper feeding about half of those that are kept at a loss could be made to yield a profit.

The average farmer milks his cows over seven hundred times each year and consumes on an average of better than twenty-seven days in doing so. Is it any wonder then that the average farmer does not like to keep cows when he feels that they are not making him a good profit when it takes so much time and labor to care for them?

As each cow in the herd is different from every other one, she must be fed and cared for in a different manner perhaps than the others to produce her best. It requires judgment and skill to be able to feed and care for a cow so that she will produce the limit of her capacity and this capacity can only be acquired by careful, conscientious study and a close application of this knowledge in practice. Each cow should be cared for just as though she were a highly developed piece of machinery and then she will produce economically and profitably. In selecting cows for productive ability, there are several essential features that usually show on the exterior of the cow and the man that buys a cow should be able to distinguish the most of these if he would secure a good one.

There are a few characteristics that are found in every cow that is a good producer, being more or less pronounced according to the cow's productive ability. A cow to be a good producer must have a good constitution, capacity to eat and digest large quantities of food, nervous temperament, which means that she must be an

active worker and not a loafer, circulation means that she must have a large and well developed supply of blood flowing through the udder from which the milk is secreted, and by ability we mean the power the cow has of secreting milk. While a cow might have any four of these characteristics, she would not be an extra good cow without the fifth.

In selecting a cow it is always best to view the cow from the side and from some little distance, while she is standing with her side toward you or while someone is leading her by you, as you are able in this way to get a very good impression as to her constitution and capacity in this way and do not forget that your first impression is usually the best. It is then well to walk around the cow to the other side, as cows do not always look the same from both sides, and then to walk to the front where a good view of the head, horns, eyes and the chest and barrel may be seen and then step to the rear of the cow where the udder and tail and width of the hips may be seen. Then walk by the cow with one hand traveling along the neck and back where the condition as to fat may be observed, while with the other hand the texture of the skin may be determined by grasping it and pulling it out from the body. Next milk the cow or have someone else do so and examine the udder carefully. A soft pliable elastic skin indicates a good digestive apparatus, while a dry harsh clinging hide indicates poor digestion.

A cow to be a good producer must be a worker. She cannot be a loafer. We have termed this nervous temperament, and we mean by that a highly developed nervous system that produces constant activity of the animal. A cow that is chewing her cud when she is not eating and one that is always ready for her meals and that always takes note of her surroundings. This is indicated by a large wide forehead that slopes to the poll and width between the eyes, also by prominent hips and ribs and a lean open jointed backbone that is free from fat.

The udder of the high producing cows is usually a network of veins and blood vessels and the milk veins passing along the abdomen are large and torturous. The milk wells are larger and more numerous than in the light producer. The blood that flows through the udder determines the milk flow and the udder that is attached high on the back and far forward along the abdomen has greater surface that is supplied with these vessels and the flow of milk is correspondingly heavy. The thighs should be free from fat and form an arch, the widest part of which should be on the level with the attachment of the udder, which gives it plenty of space.

While it is always desirable to combine with the facts already given, symmetry of form and beauty, this is not always possible and besides it is no indication of greatness of production as many of the best cows we have ever seen are more or less deficient in these two characteristics.

Size is not an indication of the probable value of a cow as a producer, but is many times taken as such an indication by the inexperienced. Color is only a breed index and is of consideration only in that light.

## CHAPTER X.

### CARING FOR THE SICK COW.

A great many people are of the opinion that simply because a cow is a dumb brute, when she happens to be sick, she will get well with very little attention. Many cows are lost each year because they are neglected and not properly cared for during sickness, while oftentimes an animal, whose illness would have proved fatal under usual conditions, recovered, due to the good care received.

The first thing to do in caring for a sick cow is to get her into a comfortable box stall. This should be well bedded with dry bedding and, while it should have plenty of fresh air, it should be free from draughts. Plenty of light should be provided, unless some condition of the eyes is affecting the cow, in which case the stall should be darkened. If possible get as far from noise and excitement as possible where the animal can be kept quiet.

The stall should be screened in the summer months to keep out flies. If this is impossible,



the cow should be covered with a fly sheet or some fly repellant may be sprayed upon her and in the stall. In winter the cow should be protected by warm blankets.

Cows that are convalescing from sickness of any kind should not be exposed to cold rains, or to stormy or extremely hot weather. Cows that have gotten dirty should be cleaned by currying or by sponging off with warm water, after which they should be dried. Cows that are suffering with fevers should have plenty of fresh water before them at all times, and it is sometimes beneficial to take a dose syringe or a drench bottle and rinse out the mouth with cold water two or three times each day.

The attendant should use care in carrying out the veterinarian's instructions, and the patient should get the medicine regularly and in the prescribed dosage. Do not miss a dose and then at the next dose double it, as this will sometimes be dangerous, if not a fatal procedure. Observe instructions carefully and do not risk the dangers of following suggestions that may happen to be offered by disinterested parties; most of these are harmless, but many times irreparable damage may be done by their use, so do not do anything but what your veterinarian tells you to do.

### **Feeding the Sick Cow.**

We have observed many times an attendant preparing a meal for a sick cow, placing it before her and paying no further attention to it

other than observing from time to time whether or not it had been eaten. Sometimes this meal consisted of a bran mash or a thin slop. Such feed quickly starts to ferment in warm weather and, if the patient does not eat any of it within one or two hours after it has been placed before her, it should be removed. The sight of food continually would have the same effect on cows under some conditions as it would have upon human beings, causing them to become nauseated.

A sick person usually relishes a change of diet, something fresh and appetizing, some fruit or vegetables of some kind. In this respect a cow does not differ from human beings.

We have often been able to get cows to eat by offering them cabbage, turnips, carrots, apples, etc. Especially is this true during the winter months and the early spring.

When it is seasonable, young corn plants are sometimes relished by our patients. Always remember that the appetite may be greatly stimulated at times by the use of some fruit or vegetables or other appetizing substances which cows relish. Be careful lest you overfeed the patient after she starts eating.

In preparing mashes or thin slops do not fail to salt them well and do not feed them too hot nor yet too cold.

If the patient is greatly weakened a drench composed of five or six eggs well beaten up

and placed in a quart of sweet milk may be given two or three times each day.

A tea made by steeping bright alfalfa or clover hay may be offered to the patient. The hay should be cut up well with shears and packed in a large pail, after which boiling water is poured over it and the pail covered with blankets. This is allowed to stand for a couple of hours, after which the liquid is poured off and offered to the patient just slightly warmed.

Only the best quality of feed obtainable should be offered to the sick animal and care should be taken that she be not overfed. Fresh and pure water should be before the patient constantly.

## CHAPTER XI.

### DISEASES OF DIGESTIVE SYSTEM.

Digestive disturbances among cattle are very common and are usually the result of some error in the quantity, the quality or the manner of feeding. The cow has four stomachs or, rather, four separate compartments of the stomach. The paunch, which is the largest, is the receptacle that holds the food as it is first swallowed, and will hold as much as 60 gallons. This is a reservoir for the food that is eaten by the cow and is afterward remasticated. This remastication is the process that is going on while the cow is "chewing her cud," and is also known as "ruminating."

The first three compartments of the stomach are of value only in preparing the food for digestion which really takes place in the fourth part of the stomach, or the true stomach. The third part of the stomach is arranged like the leaves in a book and, after the food has been remasticated, it passes into this third compartment and is pressed and strained into the fourth stomach where the true digestive process takes place.

The feed that is given the cow should be good quality that of bad quality may ferment, causing indigestion and occasionally other chronic disease conditions. Feeds that contain too large a part of indigestible material are liable to cause such a severe strain upon the digestive organs as to overwork them, thus producing diseases of various kinds. Feeds that are affected with the various rusts, molds and fungi will often cause severe and violent inflammation of the digestive tract, accompanied by colicky pains and diarrhoeas. They may also cause the development of dangerous and often fatal ptomaines.

Cows should be fed only at regular intervals and the feeding should not be done at any convenient time, as is often practiced. The digestive organs accustomed to doing their work at stated intervals are not nearly so apt to become overworked.

Feed should not be too rich in nutrients nor too concentrated, as cows are unable to subsist on feeds that do not furnish the required bulk. Cows require a certain bulk in their ration and it has been determined that a cow requires somewhere in the neighborhood of 25 pounds of roughage per day, as a necessary part of her ration. If the digestive organs are not properly distended the cow will become restless and show evidence of digestive disturbance. There would be no objection, however, in feeding a concentrated feed high in nutrients and containing very little bulk by itself, if at some other time in the

day the required amount of roughage were fed

Cows that have been on a fixed ration for some time should not have their ration changed suddenly. Such a change should be worked out gradually, by adding a little of the feed to which it is desired to make the change to the feed that is being used, and by decreasing the latter a little at each feeding. The digestive organs become accustomed to the work required to digest a certain feed after it has been fed for some time. The glands also become accustomed to secreting the amount of digestive secretions that are necessary to carry on digestion of the existing ration. Thus any radical and sudden change in feeds given does not allow the various organs time to regulate their functions to the sudden change, and so digestive disturbances and sometimes a decided loss of weight result. Cows have been known to lose as much as 25 to 100 pounds from a sudden and radical change in the ration.

In cold weather, when it is possible, the drinking water should be heated to about 50 degrees. When given very cold it sometimes produces colic. Cows should be watered often and the water should always be pure and clean and not too cold.

### **Salivation or Slobbering.**

Salivation or slobbering is a local condition and not a symptom of any such diseases as foot-and-mouth disease or rabies. Such symptoms may be caused by foreign substances, such as nails and

short pieces of wire, becoming imbedded in the tongue or the cheek, or by the lodging of a foreign substance between the upper molar teeth. They may also result from eating poisonous or acrid plants or weeds, such as wild mustard. Salivation may also be caused by eating damaged or spoiled feed or sharp ensilage. If due to the feed this should be discontinued at once. As local treatment dissolve a level tablespoonful of pulverized alum in one-half pint of water and syringe out the mouth twice each day.

If it is caused by some foreign substance becoming lodged in the muscular structures of the tongue or cheek it should be removed. In examining the mouth of the cow the tongue should be firmly grasped and pulled out of the mouth and a mouth gag or a speculum should be inserted between the teeth to keep the mouth open. A mouth gag is nothing more than a small block of wood to which is attached a piece of spring metal to hold it in place and it lies inserted between the molar teeth. It is safer and more practical than a mouth speculum.

### The Teeth.

The teeth of cows do not receive the same attention that is given the teeth of horses, yet cows have much more trouble with their teeth than the average farmer supposes. They have irregularities that may come from the unequal grinding of the teeth and from the sand that is sometimes picked up with the grass. Occasionally the

controlled. As soon as a swelling is noticed that would indicate there is an ulceration at the root of the tooth the swelling should be painted twice daily with tincture of iodine. If this treatment fails to bring marked improvement within a few days a veterinarian should be called to drill with a bone drill through the bone at the swelling to liberate the pus and remove the tooth, which is teeth are broken or split by biting on some hard object that is picked up with the feed. Cavities, due to injuries to the enamel, are often found in the teeth. Ulceration of the teeth is quite common in milk cows and usually affects the upper molars. A hard swelling appears on the cow's face below the eye; it grows rapidly larger in size, is tender to the touch and the cow will often show that it is difficult for her to eat. This enlargement opens in the course of several days if it is not properly treated and then discharges a small quantity of very foul-smelling pus. Once in a while an extra tooth will be found that interferes with eating in some way; this is known as a supernumerary tooth.

To examine the cow's teeth it is necessary to use the gag or speculum previously described, and the examination should be made in a good light. If the teeth are uneven, due to grinding, they should have the sharp points removed by the same method that is used in horses. If it is necessary to extract any tooth or part of a tooth it will be necessary to cast the cow and tie her securely so that the head can be properly



usually diseased, then treat as any other abscess cavity.

### **Inflammation of the Mouth.**

Occasionally cattle are affected with sore mouth, due to eating irritant plants or spoiled feed and sometimes to sharply cut ensilage. When the mouth is examined it is found to be dry and hot; the tongue and cheeks are very red. The animal is often bothered in eating and drinking while in this condition.

If the condition is not too severe it will correct itself in a short time, otherwise the feed should be soft and of a liquid nature, such as mashes and slops, and the mouth may be rinsed out twice each day with three or four ounces of the following solution: Pulverized alum one ounce, potassium chlorate, one ounce, and water to make one quart.

### **Sore Throat.**

This is an inflammation of the mucous membrane lining the throat and is very seldom found alone, but usually associated with some of the more severe respiratory diseases, such as pneumonia, bronchitis or pleurisy.

The muzzle is dry and the saliva dribbles from the corners of the mouth. The head is slightly extended and held rigid. The eyes are drawn so that the animal has a sleepy appearance. The animal stands quietly, scarcely changing its position, and the eyes are bloodshot. It drinks with

great difficulty, and may chew some food but may drop it from the mouth rather than make an attempt to swallow it; water is taken into the mouth but instead of swallowing it the animal allows it to run out between the lips.

The water that is offered the animal should be warmed, and the feed should consist of slops and mashes and hay or linseed teas. No coarse, harsh feeds of any kind, such as hay or fodder, should be given. Take an eight-ounce bottle and in this place one ounce of tincture of iron chloride and fill with glycerine; then place one ounce of this mixture on the tongue three times each day. Bathe well the region under the throat and between the lower jaw bones with ammonia or white liniment two or three times each day. Keep the animal in a well ventilated yet warm stall and do not allow it to be exposed to the weather or storms. Recovery should take place in from three or four days to one week.

### **Mumps.**

This is an inflammation of the parotid gland and occurs in cows of almost all ages and under almost all conditions and different kinds of care. The parotid gland lies just under the ear and extends downward to about the angle of the jaw.

This condition usually starts with a chill which is quickly followed by high fever in many cases. The head is extended as if the neck is stiff and a slight swelling is noticed

in the region of the parotid gland. If only one side is affected the head will be turned to one side. This swelling is very tender to the touch and the animal will try to avoid having it manipulated. This swelling usually reaches its height in about 24 hours. The animal usually refuses all feed and may attempt to drink a little water, but may desist due to the pain it causes.

The animal should be placed in a well ventilated, yet warm and comfortable, box stall; water should be placed where it can be easily reached. Thin slops and mashes should be offered, but no fodders or hays. Paint the swelling three times daily for the first three or four days with tincture of iodine, and after that once each day. Recovery in most cases takes place in from a week to ten days but in aggravated cases and where abscess development takes place the recovery may be delayed for three or four weeks. If abscess forms in the gland a veterinarian should be called as soon as the presence of pus can be determined by pressure of the gland with the fingers, and he should liberate the pus at once by the use of a sharp knife. The bacterin treatment as applied by veterinarians is very valuable in this condition.

### **Bloat.**

This condition is also known as hoven or tympanites. It is characterized by a filling up

of the left flank and by the formation of gas. It is brought about by a wide variety of conditions but chiefly by eating spoiled feed, or feed that is wet with dew or rain, or it may result from eating too fast which produces indigestion with a rapid fermentation and formation of gas. It may also result from choke due to the closing of the gullet which prevents the belching of the gas, and consequently the retention of gas causes the bloating. It may also result from the eating of frozen roots or grass, or vegetables such as turnips, cabbage and the like. It is caused most often from eating clover which is wet with dew or rain and in many cases is fatal before the animal is found. Most digestive disturbances are accompanied by bloating.

The swelling in the left flank becomes so great that it sometimes extends above the level of the back. Breathing becomes fast and difficult. The eyes have an anxious and painful expression. As bloating continues the animal shows symptoms of great pain and may reel and stagger when it walks. Death is caused from the pressing forward of the diaphragm upon the lungs which results in asphyxiation.

If the animal is in immediate danger it should be tapped immediately. If it is not possible to procure immediately a trocar, which is made especially for tapping, use a sharp butcher or pocket knife. Do not attempt to procure antiseptics and sterilize the spot where the incision

is to be made if the cow is in immediate danger. The animal should be tapped midway between the last rib and the point of the hip and about the same distance from the backbone. When the animal is not in immediate danger a rope gag is made by tying knots in a rope and placing this bunch of knots in the mouth and passing the ends of the rope up over the head where they are tied. The animal by chewing the knots in an effort to dislodge them will cause the secretion of saliva with swallowing. The gas will then pass off by way of the gullet or oesophagus.

There are several anti-ferments that are good for the treatment of bloat in preventing the formation of the gas. From two to four tablespoonfuls of spirits of turpentine given in one-half pint of linseed oil, or in milk, will sometimes be all that is required. Possibly the best treatment is one and one-half to two tablespoonful of formalin in one quart of water as a drench. This treatment has been credited to workers at the Kentucky State Agricultural College.

Urotropin is another medicine that can be used to treat bloat. It is a white granular substance with a slightly bitter taste and looks somewhat like coarse granulated sugar. It is made from ammonia and formaldehyde and should be kept in a tightly corked bottle. Give from two to four level teaspoonfuls in a half-pint of water and repeat in an hour and a half

if necessary. It is not irritating to the mucous membranes while formaldehyde is, unless it is well diluted.

### **Impaction of the Rumen.**

This condition is one of the most difficult to handle due to the fact that it is quite hard to diagnose the condition and many times the animal is overtreated. The symptoms of this condition are very irregular. It is the result of an animal eating too much food or eating feeds that were not fit for feeding.

A cow with an impaction may eat until the condition becomes very grave or she may refuse feed altogether. In all cases one can hear a grunt when the animal breathes. In some cases it can be heard all the time and at other times it may be heard only occasionally. In standing behind the cow the backbone appears to curve upward and to the left. By pressing in the region of the rumen its contents feel soft and doughy or rather firm, and the indentation made by the fist will remain for some little time after the fist is removed.

In the treatment the first and most important thing to do is to remove all feed. Water should be allowed freely. Stimulants and anti-ferments constitute the balance of the treatment. One-half teaspoonful of fluid extract of *nux vomica* should be given every three or four hours and one teaspoonful of salol should be given with it to prevent fermentation. As soon

as the cow begins to chew her cud and act natural she should receive a dose of castor or linseed oil. There are two operations that are necessary to cure impaction when it is determined that medicinal treatment is of no avail, but these operations can be performed only by a veterinarian.

### Choke.

Choke in cattle is usually the result of swallowing turnips, apples, beets, potatoes and the like, and sometimes from gorging chaff or straw. It is quite common in the fall of the year in cows that are pastured in orchards, especially after a sudden windstorm that blows the apples from the trees to where they may be eaten by the cow.

The animal that is choked will show a varied line of symptoms and it is sometimes difficult to tell whether the animal is choked or not. When drinking water, it will return through the mouth if the choke is complete, but if the gullet is not entirely closed the animal will be able to swallow. If the gullet is entirely closed the animal will usually bloat, owing to the fact that the gas that is constantly being formed in the paunch cannot be passed upward through the gullet with the food that is being remasticated, and thus accumulates in the paunch. Sometimes the breathing is quickened.

If the object lodges in the throat and assistants can be procured to hold the animal, a mouth gag

may be used and the hand passed over the base of the tongue and the object grasped and removed. It is quite difficult and in most cases impossible to locate the choke in cows, but if possible a firm massage with pressure directed upward may do some good, and if judgment is used no harm will result. Do not take two hard objects, such as stones or bricks, and strike them together over the seat of the choke in an attempt to crush whatever may be the cause. This will produce injury to the gullet worse than the choke, and besides, it is barbarous. Do not run a whipstock or broomstock down the throat in an effort to dislodge the choke; this is dangerous. We have obtained the best results the past few years by administering apomorphine hydrochloride hypodermically. In our experience any choke that can not be relieved by this method, can not be relieved by any other by which the animal's life may be saved. Meddlesome interference in such cases as these is dangerous. Do not attempt to drench a cow when in this condition, as she may breathe in some of the drench and die.

### **Depraved Appetite.**

This condition is also known as pica. It is an abnormal appetite for foreign bodies and indigestible substances. Cows so affected will eat old shoes, rags, wire, manure, stalks and any other indigestible substances that they may happen to procure. This affects the family cow much more often than it does cows that are in a



herd. It is supposed by most authorities that this condition is due to a slight derangement of the digestive system. Cows will leave good nutritious feed of the very best quality to eat stalks and manure and seem to relish them. This would indicate that the condition is due to an unbalanced ration.

As soon as it is noticed in a cow special attention should be paid to the ration. A liberal allowance of salt will sometimes remedy the trouble, but in case it does not, one ounce of tincture of iodine should be placed in an eight-ounce bottle and the remainder filled with glycerine. Give the cow one ounce of this mixture night and morning. If this condition is not corrected in some cows they will become unthrifty, hide bound, lose flesh and frequently suffer from a complication of diseases. Cows that are so affected should have the mouth examined for any possible injuries.

### Overfeeding.

Overfeeding usually affects the family cow, especially the city-owned cow. Most of these cases do not present any predominating symptoms by which the condition may be diagnosed. The feed that such cows receive and the manner in which they receive it, warrants us in diagnosing all cases that show no pronounced symptoms as this condition until something shows up that enables us to make a correct diagnosis. We are justified in treating all obscure diseases of

city cows as overfeeding until recovery takes place or until symptoms show themselves by which the condition may be recognized.

The first and most important thing in the treatment is the taking away of all feed. Allow water often, but in small quantities. Give a laxative of epsom salts and enforce starvation until recovery.

### **Loss of Appetite.**

The animal usually, if not always, fails to present any symptoms by which the veterinarian can arrive at a solution of the cause of the trouble. The cow just seems unnatural and does not have the appetite that she should have, sometimes failing to eat at all. As nothing else seems wrong, the owner often fails to call the veterinarian until two or three days have elapsed. Even after careful examination one will be unable to find anything that would indicate that the cow is sick. It is due probably to a condition of the nervous system that governs the digestive apparatus, possibly a temporary paralysis. The cow refuses to eat and it may be anywhere from two or three days to a couple of weeks before she resumes eating.

Our treatment for this condition must necessarily be experimental, since we do not know the exact cause of the condition, but our best results have come from the use of the following: One ounce of fluid extract of *nux vomica* with three ounces of dilute hydrochloric acid, one table-

spoonful of this mixture to be given in a half-pint of water three times each day.

### Dyspepsia.

Dyspepsia is also known as indigestion or gastro-intestinal catarrh. It may be the result of a varied and widely different set of conditions—irritant or spoiled foods, foods that are binding in nature, thus hindering the secretion of digestive fluids and preventing the absorption of the nutritive elements of the food that is eaten; feed that is too fibrous and that may contain too much indigestible matter, or a feed that is used over too long a period of time and in too large quantities. Lack of exercise will also predispose to this condition.

The animal has an irregular appetite, is listless and the eyes seem sunken. Constipation and diarrhoea alternate and the manure that is passed is usually dark and foul-smelling and in small quantities only. Occasionally the animal may be heard to grunt and chews the cud only at intervals. The passage of manure almost ceases but small quantities of mucus are passed. The ears and the base of the horns are alternately hot and cold, and the animal lies down most of the time. She may carry a slight temperature. The animal gradually gets weaker and loses flesh rapidly; finally the milk flow has entirely ceased and the cow reels and staggers when she attempts to walk. In many cases a brain disturbance is noticed at about this time, due no doubt to the

pain and general weakness and to the poisonous products that are absorbed from the digestive tract.

The very best and most appetizing feed should be offered several times each day, and if the animal eats at all, care should be taken that the digestive organs are not overworked; water should be given and should have the chill removed. Treatment of this condition is of grave importance, and should be prescribed by a veterinarian after he has examined the case. Possibly the treatment prescribed for loss of appetite would give as good results in the majority of these cases as anything that we might be able to suggest or advise.

### Colic.

This condition is most often produced by drinking freely of cold water and, as the animal suffers a chill shortly after drinking and immediately before the colic starts, the cause of this condition cannot be doubted.

The animal begins by kicking at the abdomen with the hind feet and stepping from side to side in the stall. The pain becomes very severe and the animal will throw itself to the floor. In some cases bloating is present.

In mild cases walking exercise for ten minutes or so will sometimes relieve the condition. A tablespoonful of ginger, either alone or with one tablespoonful of tincture of capsicum will usually be all the treatment that is required. It

should be given with milk or water as a drench. If a veterinarian can be had and no bloat is present, a hypodermic injection of morphine or some other hypnotic is all that is required.

### Dysentery.

Dysentery is, simply speaking, a severe diarrhoea, which may be caused by the eating of irritating or spoiled feed, exposure to inclement weather, parasites, indigestion and the like.

At first the stools are soft, but gradually get watery, often foul-smelling, and are sometimes streaked with blood. The animal has an anxious expression, is haggard in appearance, weak, and may show some evidence of abdominal pain. The appetite is lost or is irregular and the animal rapidly weakens and loses flesh. If the condition is not remedied early, it may result in death.

If the cause is due to the feed or to parasites, cure can be made either by changing the feed or by the administration of suitable vermifuges to cause destruction of the parasites. A dose of castor or linseed oil should be given and should be followed by two or three tablespoonfuls of the following mixture: Tannic acid, one ounce; pulverized sulphate of iron, two ounces, and sodium salicylate, two ounces, all thoroughly mixed. This should be given in a solution of water, about one pint being sufficient. This makes a black solution resembling ink. This mixture has given much better results in this

class of conditions than anything else we have ever used.

## CHAPTER XII.

### **"DISEASES OF THE RESPIRATORY SYSTEM."**

There is surely no class of diseases of cows that require as much skill from the veterinarian if he would make a correct diagnosis as those of the respiratory system. You know that the regular physician has both the subjective symptoms by which his patient can assist him in arriving at a diagnosis and beside he has the objective symptoms or those that he can detect from physical examination. The veterinarian who would be successful in differentiating the diagnosis of these different conditions must have a very good knowledge of the anatomy and physiology of the respiratory organs, when in the healthy state and he must have a systematic and careful manner of examining the patient. Many different things must be taken into consideration, and it truly is a fact that the veterinarian who is able to intelligently and successfully treat diseases of cows, is and must be a good diagnostician.

The history of the case should always be learned as well as possible, but too much dependence must not be placed in this, as some people will deliberately misrepresent matters to test the skill of the veterinarian. Determine whether the condition is acute or chronic; this can many times be determined from the general condition of the animal, always remembering that bad weather is usually the cause of this class of diseases in cows.

Careful notice should be taken of the sanitation of the quarters in which the sick animals have been kept. Inquire as to whether the animal has had any treatment and what kind. Do not be afraid to get the history of the case.

The experienced cattleman can draw many conclusions from the attitude and position of the sick cow. They have a characteristic expression and attitude that they assume while standing, while walking, when lying down or when getting up. They have a peculiar facial expression. Many men can tell by looking into the face of a cow that they are in pain. When they have a high fever the skin seems dry and harsh and inelastic; this fact is quickly noticeable. The general condition and the state of nutrition in which the animal is found will many times be indicative of the length of time the animal has been sick. Never fail to take into consideration the age, breed, temperament and the constitution of the ani-



mal, as this has a very material bearing many times, in arriving at a diagnosis.

When the mucous membrane lining the eyes, nose and mouth is paler than usual, it indicates that the animal is illy nourished or has lost blood from disease or from hemorrhage. In other cases where this membrane is very red, it indicates that the animal has a fever or an inflammation. When the membrane is bluish it is an indication that the blood is not receiving enough oxygen. This condition is found in severe pneumonia or weak heart.

Cough may be either a primary symptom of disease when it is due to the irritation of the mucous membranes lining the respiratory organs, or it may be secondary when it is the result of some derangement of the intestines or stomach or other parts of the body that have a nervous communication with the respiratory apparatus. A cough has special characteristics and are known as dry, harsh, moist, difficult, sympathetic, and hollow, and each of them has a special significance to the trained observer.

The respiratory acts or the breathing, has an important part in the determining of this class of conditions. We may have labored, intermittent, accelerated, slow, deep, shallow, irregular and imperfect respirations. The act of respiration consists of taking the air into the lungs or inspiration, and throwing the air

out of the lungs or expiration. In the normal, healthy cow, the respirations are from 15 to 18 per minute. Several things will change this however, among them being pregnancy, rumination, or chewing the cud and sleeping. After making observations in healthy cows one soon learns to recognize a great difference in the respiratory movements. A filling up of some of the area in the lungs with exudate in pneumonia, pleurisy, or pain of the chest walls, fluid in chest cavity, weak heart, adhesions between chest walls and lungs, (such as often occur after pleurisy), bloating of the rumen, growths in the nose and throat or swelling of the throat and fevers will all cause rapid, irregular and difficult breathing which is known as dyspnea. A very valuable symptom when properly interpreted.

It is well to take the temperature of all sick cows. The normal temperature of the cow is from 101 to 102 degrees Fahrenheit, but pregnancy, digestion and exercise will make slight changes in the temperature, but when there is a rise of 2 degrees, or more it is the result of some diseased process. The thermometer should be inserted in the rectum and be allowed to remain two or three minutes.

The secretions of the mucous membranes will change with varying respiratory disorders. With cold in the head, you will have moist, wet secretions from the eyes and nose

while with bronchitis and some conditions as pneumonia where the temperature is high, the mucous membranes will be quite devoid of secretions and are quite dry.

The pulse of the cow is somewhat faster than the horse, being normally 45 to 50 times a minute. We have a fast and a slow pulse, a full pulse, an imperceptible pulse, regular, irregular, thready pulse, large pulse, small pulse and intermittent. The pulse is best counted and studied by pressing the fingers against the submaxillary artery where it passes under the lower jaw bone. It is necessary to press the artery against the jaw bone in order to determine the character of the pulse. Much practice with the pulse of healthy cattle will enable the operator to arrive at an accurate conclusion of the characteristics of the pulse in various diseased conditions.

By applying the ear over the chest wall in the region of the lungs soft whistling, rustling sounds are heard. If the lungs are partly filled with fluid due to pneumonia or if secretions are abundant from any other causes, the air will make a bubbling, crackling sound as it passes through the liquid. The bronchial sounds are much plainer and are more harsh and rasping like, than the sounds emanating from the lungs. Practice is the only means we learn, to differentiate between these different sounds. There is a peculiar sound that is caused by the lungs and the lining of the

chest rubbing together when an animal has pleurisy and when it has been heard a time or two, it is very easily recognized in subsequent cases.

By tapping or striking over the diseased part we are sometimes able to tell of the condition of the part from the sounds that are produced. The lung in health is always filled with air and due to this fact, a hollow resonant sound is produced when tapping or striking above the part. Usually this is done by placing the left hand flat upon the chest and tapping upon it smartly with the first three fingers of the right hand. The left hand is moved over the region of the lungs and we are sometimes able to recognize a filling of some parts of the lung, with a fluid or a solidification of a part of the lung. This is another means of diagnosis that can only be acquired by diligent and persistent practice.

### **“Cold in the Head.”**

This condition is also known as catarrh of the head or sometimes as rhinitis.

This condition is usually mild and very seldom fatal, but if complicated by a severe sore throat it is sometimes fatal. It is most often brought about by animals that are accustomed to shelter, being exposed to damp or stormy weather. It may also be caused from irritating or noxious gases. At first a reddening of

the lining of the nostrils and eyes is noticed. This is quickly followed by a watery discharge from the eyes and nose. At first not much attention is paid to this condition but the discharge becomes more profuse and the animal develops a high temperature and the discharge may become heavy and contain pus. The animal becomes greatly weakened and is dull, does not move around much, has an impaired appetite.

The first thing that should be done is to get the animal into a warm yet well ventilated barn. If cold, blanket the animal. All drinking water should have the chill removed. Only the best of feed and that in small quantities should be given. Take six ounces of spirits of camphor and two ounces of fluid extract of belladonna and give one (1) tablespoonful of this mixture in a little water as a drench about every three or four hours. Good care is the most essential thing in the treatment.

### **"Bleeding From the Nose."**

This condition is often spoken of as epistaxis, and is quite rare in cattle. This condition may be the result of injuries the same as in other animals, but it is not at all common. In aged cows in an unthrifty condition we have sometimes seen quite a severe hemorrhage or bleeding from either one or both nostrils. This usually takes place from a month to six weeks before the pregnant cow gives

birth to her young. Does not occur in cows that are not with calf. The bleeding may persist until several pints of blood has been lost and then cease of its own accord, but many times leaves the animal in a weakened condition. If this condition is not properly treated these hemorrhages may recur at intervals of a week or ten days and then at calving time if the cow experiences any great difficulty in giving birth to her young it may leave her in such a physical condition that death will result.

Keep the animal quiet and bathe the head and nostrils with cold water. Apply cold water to the head. Tie the head up to a rack or beam. If it does not stop within a reasonable time call a veterinarian who can either use styptic injections to check it or hypodermics of adrenalin. To prevent the recurrence of the hemorrhages take 8 ounces of the tincture of iron chloride and of this give two (2) table-spoonsful in water as a drench, night and morning until the cow has calved when all danger will have passed.

### **"Bronchitis."**

This is an inflammation of the mucous membrane lining the bronchial tubes, be they the main bronchi or the capillary bronchial tubes. This condition is most often spoken of as catching cold. It in itself is not often fatal, but if complicated with other diseases it may prove fatal.

The animal's temperature may go up to 104 or 105 degrees. A cough is present which may be and usually is indistinct and incomplete. The inspirations are incomplete and short and gives the animal much pain. The expirations are prolonged. By placing the ear over the lungs various sounds may be heard corresponding to the extent to which the disease has progressed and the amount of exudate that is present. If, however, these bronchial tubes fill up with fluid the animal dies from suffocation. The appetite is lost and the pulse is fast and hard.

The animal should be placed in a well ventilated and comfortable box stall. The bowels should be kept in good condition by the use of laxatives and proper feeds. Keep the cow warm even though it requires blanketing. Use the following: Fluid extract belladonna 2 ounces; spirits of camphor, 4 ounces, and aromatic spirits of ammonia, 10 ounces. Give two (2) tablespoonsful in water as a drench three times each day. The animal should be fed lightly and it should be of the best quality. This condition is apt to become chronic and then not a great deal can be done for it in many cases. If the case seems severe from the start a competent veterinarian should be employed.

### **"Pleurisy."**

This is an inflammation of the membrane lining the chest cavity and that covering the

lungs. It is rarely found as an independent disease, but usually found associated with pneumonia and is no doubt caused by the same disease germ. It may occur as an independent disease due to a fractured rib or a deep punctured wound.

When the animal is first noticed it has a great deal of pain. It does not move around much and when it does it will move as though foundered. The breathing is very fast, but is mostly abdominal and very shallow. The ribs are fixed. Movements of the animal give pain. Pressure between the ribs causes the animal to evince pain. A short grunting sound is heard most times in breathing and the expiration is much longer than the inspiration. The muzzle is hot and dry and the appetite is absent. The animal is constipated and the temperature will be around 105 or 106 degrees Fahrenheit. If the ear is placed over the chest cavity a hoarse rasping sound is heard and this is caused by the rubbing together of the two dry inflamed surfaces. After a couple of days the temperature drops to 103 or 104 degrees and the animal begins to eat and secretions of the serous membranes begin to fill up the chest cavity and the sounds become less harsh as the cavity fills up. If medicinal treatment can not stimulate the absorption of this fluid in the cavity, the animal gradually grows weaker, the breathing shorter



and more hurried and the animal has an anxious haggard expression, which is soon ended by death. If a veterinarian can be had that can perform an operation and draw off this fluid from the chest cavity from time to time it may be the means of saving the animal's life. Death will not usually occur sooner than from 10 days to two weeks nor later than the third week.

Give the animal the same general care as recommended for bronchitis. Keep the bowels active. Give the same treatment for the cough here as mentioned under bronchitis. Take of fluid extract of bryony and give one (1) tablespoonful in a little water every three hours; this will very materially assist in the absorption of the exudate. Take of oil of mustard one-half ounce and petroleum eight ounces. Thoroughly mixed, rub in on each side of the chest over the lungs. Do not rub too vigorously; this will have the same effect as a mustard plaster and is much easier kept in place. If the life of the animal is threatened it requires an operation as mentioned above which must be performed by your veterinarian.

### **"Pneumonia."**

This condition is divided by most authors in at least three different types or classed in three different groups, but we feel that very few individuals can differentiate between these

conditions clinically, and as the treatment of them all is practically the same, we will speak of it simply as pneumonia. All of these types are caused by the same germs and the only difference is in the way the respiratory organs are affected.

The condition immediately preceding the pneumonia of cows is congestion of the lungs. The animal may be seen having a chill which may last only two or three hours or which in other cases may last several hours. This may be of short duration and escape the attention of the attendant. The temperature will be found to be 105 or 106 degrees Fahrenheit, and occasionally even higher than that. The respirations are greatly accelerated and very shallow, the pulse is quick and hard and the nostrils are dilated; a cough may be present at this time. The nose is hot and dry and the animal is usually constipated. Pressure between the ribs over the lungs gives the animal pain. The animal stands with the forelegs spread apart and the elbows turned outward. The hair is standing on end and the skin is harsh and dry. On placing your ear over the region of the lungs a soft crackling, snapping sound will be heard. During this time the animal stands most of the time. After this first stage has passed the temperature drops somewhat and the animal lies down most of the time. The expression becomes haggard and the pulse becomes hard and wiry.

The secretion of milk is almost suspended. The sounds of the lungs are nothing but a whistling or wheezing sound. If the lungs could be seen at this time they would very much resemble the liver in appearance.

If the animal is going to recover the cough becomes loose, and the other symptoms begin to subside, the appetite returns and the animal is generally improved in all ways. If, however, the case is not progressing favorably the breath will have a foetid smell and is taken in very short gasps. The extremities are cold and feel clammy and the pulse can not be felt. These symptoms are an indication that death is a matter of a very short time.

It is doubtful after the first symptoms of pneumonia have developed if it is possible to abort the disease, but we do feel that if intelligently handled at this time that the severity of the attack can be so lessened as to make it a comparatively slight ailment in many cases and greatly lessen its effects in most others. This condition should be treated early, as this is the time when the real good is done. In this condition the more fresh air the better, just so there are no draughts. Blanket the animal well and then see that there is an abundance of fresh air. See that the bedding is clean and plenty of it. The chill should be taken off the drinking water. The feed should be given often and in small quantities and should be appetizing. The first thing to do

after blanketing the animal and making it comfortable in the right surroundings, is to apply a coating of the mustard and petroleum as referred to above. Have your druggist put you up several powders of Sparteine sulphate each containing 30 grains and dissolve one of these in a small quantity of water and give every four hours. If the animal can be kept eating it will greatly favor the patient's chance for recovery. For this take fluid extract of nux vomica and gentian of each two ounces and give of this one-half tablespoonsful every three hours in a little water. If the animal is constipated give a small laxative dose of epsom salts or oil.

### **"Heaves."**

This condition is also known as emphysema and is caused by a rupture of the very small air cavities of the lung. It makes a peculiar respiratory action in which the inspiration is normal but the expiration is prolonged and difficulty in expelling the air from the lungs. The diagnosis can be made from this characteristic breathing. The animal is usually emaciated, hide bound and the coat is staring.

There is no treatment for this condition and as it does not materially affect the milk flow nor the appetite and the best thing to advise is to prepare such animals for the block where their condition is such that they will make good meat and why not destroy them for humanity's sake?

## CHAPTER XIII.

### TUBERCULOSIS.

Tuberculosis is one of the most widely spread contagious diseases of any of the domestic animals and this is very forcibly brought to mind from the large number of carcasses and parts of carcasses that are condemned each year at the different abattoirs. The percentage of tuberculosis is much greater in dairy cattle than it is in beef cattle and this can be explained in this way. Dairy cows have the added work of producing milk and in addition to this they must furnish nourishment during several months of the year for the unborn young which is developing. This would necessarily lower the resistance of the dairy cow much more than that of the beef animal. The loss in the United States in a single year amounts to many millions of dollars, but the greatest factor to be thought of is the fact that it can be and is transmitted to human beings. The percentage of tuberculosis among milk cows will be about ten per cent.

Even though tuberculosis was not transmissible to human beings it would be desirable to eradicate it from among our cows from an economic standpoint, as it often destroys cattle outright by killing its victim, reduces the market value of the animal, lessens the production, injures the reputation of the animals for breeding purposes and carries infection to other farm animals.

### **The Cause of Tuberculosis.**

Tuberculosis is caused by a small germ called by the same name tuberculosis, but it is spoken of as bacteria tuberculosis in literature to indicate that it is a small rod shaped germ. This germ was discovered in 1882 by Dr. Robert Koch, but at that time it was thought of as a disease affecting people only and that there was only one form of germ that was responsible for tuberculosis wherever found, but it has been determined that while tuberculosis may be transmitted from animal to man the tuberculosis germ that affects cows and that which affects human beings are two separate and distinct germs, but are very similar in characteristics.

The germ that causes tuberculosis is very small and can only be seen by a high powered microscope and it would take several thousand of them placed end to end to make a column one inch long.

### Nature of Tuberculosis.

Tuberculosis is thought by many to be distinctly a condition affecting the lungs but such is not the case. It may be found in any part or any organ of the body. The condition may be quite extensive or it may be so slight as to be almost unnoticeable.

It is frequently found in the membranes lining the abdominal cavity and the cavity surrounding the lungs and when so it usually has the appearance of very small rounded nodules which may be very thickly studded over the surface or may be very few in numbers. These small nodules have the appearance of pearls hence this condition has often been spoken of as "Pearly Disease."

In other cows the lymph glands which are situated throughout the body are affected and the substance which they contain is cheesy like in appearance and when cut into seems gritty. The lymph glands are those little glands situated in the thin membranous curtain which holds the intestines in position. They are also found along the top-most portion of the lung and many other parts of the body. They range in size from a kernel of wheat to the size of a small hickory nut.

When the lungs are affected they become heavy and solid and light in color and usually contain large quantities of pus and also portions of the lung will have become necrotic

and broken down. This process gradually spreads but it sometimes requires several months to bring about the death of the animal.

These lesions may also be found inside the bones, within the spinal cord or the brain and this is the reason that some animals are killed after reacting to the tuberculin test and no signs of the disease can be found.

### **Symptoms of Tuberculosis.**

It may seem very strange to hear it said that there are no symptoms by which tuberculosis can be recognized with any certainty in the live cow but such is the case. There are cases of tuberculosis in which a diagnosis can be made, but these cases are usually very pronounced cases and are also very rare. There are very many symptoms that would make one suspicious of tuberculosis, but many times these are not noticeable; we have observed many surprised cow owners when having their herds tested, at the large number of reactors that were found. Since about 10 per cent of the cows in the United States are thought to be tubercular, it is well to suspect this disease in all untested cows that show any signs of a constitutional disturbance that tends to be chronic.

Cows that lose flesh and remain thin even with good care and feed; that have a dry harsh coat of hair that is staring; that have an irregular appetite, or digestive troubles; those that



fail to get with calf; that cough and appear to be weak and listless, can very safely be suspicioned as being tubercular.

### The Tuberculin Test.

The only positive way of finding out whether a cow has tuberculosis or not is to have her tested by a competent veterinarian. In our opinion no one save one who has had a veterinary training can successfully make the tuberculin test, and for that reason we can not give the method of making the test here.

The tuberculin test has proven to be more than 98 per cent correct from many thousands of tests that have been followed by the post-mortem on the tested animals.

There are two methods of making this test that are being used today; they are the temperature test and intra-dermal test. In making the temperature test which is the only one recognized by the United States government and many of the states, the tuberculin is injected under the skin and beginning several hours afterward the temperature is taken several times at regular intervals. An elevation of temperature of 2 degrees above the normal temperature of the animal before the injection of tuberculin is considered a reaction and the cow is tubercular. In the other methods a very small needle is used and a concentrated tuberculin is used and is injected between the two layers of the skin. This injection is usually

made in the fold of skin reaching from the tail to the anus. An enlargement or thickening of this fold of skin indicates that the animal is tubercular. The latter method can be more easily applied and we believe just as positive in its reactions. It requires a greater experience to enable the veterinarian to use the intra-dermal or the skin test.

Many cow owners are of the opinion that the tuberculin test is harmful to their cows, but nothing could be farther from the truth as there can not possibly be a live germ in the tuberculin after it is prepared and ready for use. In the preparation of tuberculin it is boiled several times and also filtered through the finest porcelain filters which are capable of holding up any germs that can be seen by the aid of a microscope. So it is well to keep in mind that tuberculin can not possibly do your cows any harm and that it is the only reliable method that we have of determining the presence of tuberculosis in the cow.

### **The Control of Tuberculosis.**

After we have learned that a cow has tuberculosis or that a herd of cows have tubercular ones among them, the question of the best way to dispose of them, comes to our attention. There are many things that govern this, among them being the value of the animal, the extent of the disease, the value of the animal for breeding purpose, etc.

If the herd is very small and the cattle are of common type and of ordinary value the best thing to do is to send them to some abattoir that has government inspection and sell them subject to inspection and in this way you will receive just what they are worth to the packer as shown by the inspection.

If there is only a few animals out of a large herd that are found to be diseased they can be separated from the well ones and the others retested at intervals of six months while the diseased ones should be destroyed.

If the herd contains some valuable breeding animals that are tubercular they may be separated from those that are well and kept in separate stables and separate pastures and the calves as soon as dropped are removed and fed upon the milk of healthy nurse cows or on pasteurized milk. In this way diseased cows can many times produce a number of valuable calves and help build up the herd. By this method which is known as the Bang method it is often possible to realize a reasonable salvage on some valuable breeding cows.

Regardless of the method that is used in disposing of the tubercular cows, a thorough disinfection of the barn in which these animals have been kept should be performed as soon as they are removed.

## CHAPTER XIV.

### CONTAGIOUS ABORTION IN CATTLE.

By the term contagious or infectious abortion we refer to those cases of abortion that occur enzootically in otherwise healthy animals from some infection that produces a local inflammatory condition of the uterus and foetal membranes of the foetus. This condition has been recognized as contagious from the beginning of the last century in some of the mountainous districts of the old world, but the causative agents had not been discovered before 1876 with any degree of certainty and yet there is some controversy concerning the cause of this condition.

This is most commonly found in cows, but it may be found in mares, ewes, sows and goats. It has been possible to produce abortion by artificial inoculation also in rabbits and bitches. This is a disease that occurs mostly in fine, well bred cattle, that are kept in stables and are forced for large milk yield, and, for this reason, it has become one of the greatest menaces to the dairy industry that this country has ever known. It has also been found in range cattle. Its loss in the

dairies is not only from the number of calves that are lost, but the loss in milk flow and the trouble that is consequently encountered in getting the cow to conceive again.

This disease is caused by the bacillus *Corynebacterium Abortus Infectiosi*. It may retain its virulence for several months in the uterus of the cow, in its secretions or in the dead foetus. It is destroyed very readily by very mild antiseptic solutions.

The infection may be taken up by the external genital organs but more often it is transmitted to the cow from the bull during copulation. The bull usually receiving the infection from serving some cow which is already infected. The infection may be introduced by various objects that are used in caring for the animals. It may also be taken up with the feed and water—the feed and water becoming contaminated by the membranes and fluids which envelop the foetus. The infection of the male by the female and the consequent infection of other females soon spreads the infection through a large herd. The abortions are usually some little time apart, and, after the first one or so occurs, there will be some time elapse and it may be some little time before the owner awakens to the fact of the actually existing condition. In this way it is allowed to gain a foothold and the means that should have been applied for its prevention have not been used.

This infection which gains access to the va-

gina during copulation has the power of passing the mucous plug in the neck of the uterus, gaining access to the uterus where it sets up a catarrhal inflammation of the mucous membranes lining the uterus and also the membranes covering the foetus and also the attachments between the chorion or outside layer of the covering of the foetus and the cotyledons, to which the membrane is attached. This produces a secretion and gradually the membrane becomes loosened from the cotyledons or their attachments and then the contents of the uterus or the foetus is expelled. During this diseased condition, the bacilli causing this condition may gain access to the foetus itself. Sometimes, however, the foetus is not expelled but simply mummifies and is retained to full term and sometimes even longer. A cow will often abort twice, but not usually more than three times at the most.

Cows most often abort in the fifth or sixth month and mares from the fourth to eighth month of pregnancy. Animals that are pregnant for the first time will usually abort earlier than those that are older or that aborted previously. Abortion may occur at an earlier or later date, however. The first symptoms that are noticed are a catarrhal inflammation of the genitals with a swelling of the vulva and an inflammation of the vagina with a mucous discharge which is always dirty, but may be clear or of a dirty gray or occasionally a bloody discharge. In cows the milk flow is diminished and looks much like

the first milk or colostrum that the cows give at the first milking after calving.

In two or three days following these symptoms the abortion takes place, with slight general disturbances. If this occurs early in pregnancy, the afterbirth is usually passed with the foetus, but if it occurs later it may be passed subsequently or even retained for some little time and may be removed manually. Following the abortion there is a dirty brown or bloody discharge for several days which may be putrid. This discharge may accumulate in the uterus and be expelled at intervals by straining. When the animal is bred early the abortion usually takes place early in the stage of gestation; and, if the animal is bred after several months, the animal is more likely to carry the foetus to full term. Many of the animals fail to conceive after the abortion and most of them with difficulty. Those abortions that occur early are usually dead, but those that are nearer full term are often alive, and emit a hoarse bellowing sound which is more than likely due to some disease of the brain.

The nature of the condition can be determined by the symptoms that precede the abortion, and by the catarrhal inflammation that persists for such a length of time after abortion and by the subsequent abortions that take place in the herd, and also by the condition of the membranes of the foetus which has a large amount of purulent exudate on them. There are several sero-diagnostic tests that are being perfected for

this condition the same as we have for glanders in horses, and tuberculosis, and it is more than likely in the next few years that we shall have positive methods of determining animals that are infected with this condition.

This condition will prevail for several years if not properly guarded against. The abortions occurring with more regularity for some time and then those cows that have aborted two or three times will usually give birth to healthy calves and the new cows or heifers will abort and finally it will die out of its own accord after several years.

Those animals that are apparently healthy should be removed from those infected, if possible. If not possible, they should be kept in separate stables or in a part of the stable by themselves, and the stable should be thoroughly disinfected and the litter removed and disinfected, or better still, destroyed. Those healthy animals should have the external genitals and vagina washed once or twice daily with a mild, non-irritating antiseptic solution. The antiseptic should not be strong, or it will produce an irritation and straining.

Animals that have aborted should have their uterus irrigated two or three times daily with an antiseptic solution till the discharge has stopped, and then every two or three days for about two weeks. The foetus should be burned or else scalded and buried deeply. The litter or bedding should be destroyed and the stall should



be thoroughly disinfected. The animal should not be bred for about two months after the abortion, and if she then fails to conceive, if she has had proper treatment, she should be sold.

Methylene Blue has to date given by far the best results in the treatment of this condition in the way of an internal treatment, but should be employed in two or three times as large doses as are usually used. Carbolic acid has been recommended both subcutaneously and orally.

New animals that are brought to the herd should be kept by themselves and watched for some little time before being placed with the herd. They should receive the same prophylactic treatment as the other members of the herd. By keeping the animals that have aborted and treating them properly and then breeding them, you can much sooner get rid of the infection.

It is only a matter of time until we will be able to immunize cattle against this abortion by a properly prepared immunizing agent, the same as we are now able to immunize animals against hog cholera and against tetanus or lockjaw and several other fatal and serious animal diseases.

## CHAPTER XV.

### FOOT AND MOUTH DISEASE.

Of all the animal plagues that have visited America, that of foot and mouth disease which we have experienced within late years has made more history than all of the others combined. Its sudden appearance, the rapidity with which it spread and the proportions which it reached have caused much wonder and comment among the agriculturalists of the United States. There has been an abundance of speculation concerning this condition and a great part of it has come from people who are not experienced in diseases of this kind and therefore should not carry a great deal of weight. It is true that we have had several outbreaks in this country—three or four at least—during the last few years; but none of them reached any size before they were discovered and proper measures taken for their disposition.

A great deal has been said about the carelessness in handling the recent outbreak, but it may be possible that, if everything was known, those who were taking care of this condition were do-

ing all that could possibly have been done under the circumstances. A great many things look different to most of us once we get in on the ground floor. In the first place, very few veterinarians in this country had ever seen a case of this disease, and, for this reason, some of them were taken unprepared. Very few people realized the intent and purpose of the quarantine. The lack of sympathy and support of the farmers and stockmen of this country was another thing that was very detrimental to the administrative powers that were handling the disease, and yet the Bureau of Animal Industry did not have sufficient force with which to do all the work as they should like to have done.

It seems to me that very few people realize the vast size of the United States when they talk about many things, and they surely fail to take into consideration the vastness of the live stock industry of this country when they talk about foot and mouth disease. We have heard people talk as if they really believed that the live stock killed on account of the recent outbreak of foot and mouth disease formed a large part of the stock of this country. If they but knew what a small fraction of a per cent the number of slaughtered animals was to the total number in the United States, we are sure many of them would feel they were very foolish indeed to think as they have been thinking.

We learn from our past experiences and from the history of other peoples and nations. We

have no right to dispute authentic history when recorded by recognized authority. We have people that have never made any effort to learn whether this condition is the same as they have among the live stock of the old country, yet they do not hesitate to make the assertion that it is not. The veterinarians of America are not surpassed by any other country in the world; they are younger as a profession. However, all of our veterinarians of note have diagnosed this as the same as the European condition. Not a single veterinarian that we know of has made the claim that it is not the same disease. We have seen several cases of it ourselves, and, from what we have observed, and from what we have learned from the best European literature available, we can not see one bit of difference between this and that of the old world. While the veterinarians of this country have said that it is the same condition and offered many proofs that it is as they say, we have never found a single individual who has been able to offer one good proof that it is not. It is one thing to make an assertion of something which you believe to exist and another thing to prove it. We are at present waiting for the proofs.

It seems a shame that one of the most prominent live stock papers of this country has taken the stand that it has about this matter and stirred up the antagonism toward the veterinary profession that they have. We have one consolation,

and that is, they are standing alone. Several of the other farm papers and live stock papers have written editorials that have surely been a credit to any sane and just editor. The bad feature of the other paper of which we are speaking is that they took everything for granted and did not give the profession a chance to defend themselves. It is doubtful if any member of the profession would have deemed it worth his while to reply to such an editorial as this one.

Foot and mouth disease has been prevalent in the old world for many years and has gained such a foothold that it has very seriously crippled the live stock industry of almost all of those countries. England, France, Spain, Germany and others have spent millions of dollars in an effort to eradicate this disease and have been unsuccessful. It would seem that if they spend millions of dollars in an effort to eradicate it, they must think it is a detriment to the live stock industry. Practically all of the noted authorities on veterinary medicine in the old world claim that the slaughter method is the only method to pursue when you have a new outbreak. They have had many years' experience, why should they not know? The authorities of the United States have had personal letters from some of the best veterinarians in the European countries since this outbreak started advising them as to the value of the method they were employing in combatting the disease.

Foot and mouth disease is not a fatal disease,

and, unless complications set in, the mortality is very low. There is a type, however, known as the malignant type, in which the mortality is very high. This type is not very common. It causes its greatest loss in the reduction of the productiveness of the animal, also the loss of flesh. Fat animals that are almost ready for market lose flesh very rapidly. With milk cows the flow of milk is very rapidly diminished. It was said by a prominent veterinarian in England, and one who had a prominent part in handling the disease in that country, that the loss to each cow giving milk was at least \$20. Taking into consideration the number of milk cows in the United States, we wonder how many times this loss, if every milk cow in the United States would become affected, would be the cost of the eradication of this last outbreak. We should judge that it would be well into the thousands at least. One attack of the disease does not render the animal immune; it may have several attacks of the same disease, and besides, an animal that has apparently recovered may carry the contagion to another animal. These are known as virus carriers. It is the loss of the milk flow and also the loss of flesh that makes this condition such a detriment to the dairy industry. It is milk that they are after. Their aim is to develop cows that will produce a large flow of milk that is rich in butter-fat, and no cow that is poor and weak and thin and poorly nourished can do this.

Many people are of the opinion that this outbreak took many herds of dairy cattle, but the number that were slaughtered, when compared to the whole number in the United States, would be a drop in the bucket.

If this disease would gain a foothold on American soil so it could not be eradicated, it would be a serious factor in lowering the cost of dairy cattle, as no one would care to pay a high price for such cattle when there was such a disease lurking in this country. It would mean that several of our best breeders would quit the breeding of this class of cattle, as they would figure that the risk would be too great. This would also make the risk so great from showing animals that very few owners of high class animals would want to take the risk that would be necessary to show their cattle at shows. This condition once getting a foothold in a dairy, even though the government did not quarantine and slaughter, would in the course of a few weeks reduce the herd in producing ability to a point far below that which it had possibly taken the breeder many years to reach. Its effect upon the dairy industry would very favorably compare with that of infectious abortion; it would simply cripple many of the dairymen to such an extent that they would quit the business, as they could not stand the losses it would bring about. The ease with which it may be transmitted by various animals and other agents, including feeds, manures, grains, hays, hired help and cattle buyers

and many others, makes it a dangerous condition, to say the least.

We firmly believe that the people will become more firmly convinced in the course of time that the method adopted by the Bureau of Animal Industry during the last outbreak was the only logical way of handling this situation, and we believe in time that the people will become more educated about this condition and they will see the dangers which we hope we have escaped.



## CHAPTER XVI.

### THE COW'S UDDER AND MILK SECRETION.

The mammary glands are peculiar to all of the mammalian animals, the highest class of animals and the class to which our domestic animals belong. The mammary gland of the cow is commonly spoken of as the udder and originally only supplied milk for her young, but since the cow has been domesticated she produces milk for human consumption, one of the most important articles of food.

The udder of the cow is a compound gland divided into two symmetrical halves and each half is again divided into equal parts, thus making four quarters of the cow's udder. From each quarter is suspended a teat which has an opening at the lower end from which the milk may be drawn. Occasionally there is a pair of rudimentary teats, which are of no consequence and do not give any milk. At the base of each teat is a cavity, known as the galactophorous sinus, in which the milk is

stored. This holds as much as one quart in some cows.

The interior of the cow's udder is made up of numerous lobes, united by cellular tissue which is yellow in color. Each of these lobes is further subdivided into lobules which are composed of very small cavities known as alveoli, acini or cells. The fat content of the milk is derived from these small lobules. The fluid part of the milk is secreted here and passes through these small ducts to the lobes, where it gains access to still larger ducts. These common ducts from each lobe converge toward the base of the teat and form a cavity, known as the lactiferous sinuses; these communicate quite freely and form right at the base of the teat. The whole number of them is known as the galactophorous sinus and this is where the milk is stored until milking time.

The udder of the heifer is usually small and firm, but, as parturition approaches, it becomes swollen and tender showing that there are changes going on within it. At, or immediately after calving, milk is formed in the udder.

There are two processes that contribute to the formation of milk, as follows: The small acini or alveoli, mentioned above, furnish the fat content of the milk from the shedding of cells lining these cavities, and the fluid portion of the milk is formed from the lymph that flows through the udder. If we examine one

of these small acini or alveoli of an animal that has never been pregnant, we will find that the cells lining it, and also the small acini, are much fewer in number than they are in an animal that is milking; the cells are also of a very slow growing kind and may be so numerous as to fill up this small cavity. When the heifer gets with calf these small acini become greater in number and cells that fill them are discharged with the first milk which is known as colostrum. If examination is made before the udder has been milked, the cells lining these small acini will be apparently flat; but if the udder is milked out the cells will be long with a constricted base and coming free from the base are discharged as the fat of the milk. They leave behind them the parent cell from which other cells grow. This process, continued, produces the fat content of our milk. No fat consumed by an animal, but a protein diet influences the fat content of milk. It is needless to say that these examinations must be made with a microscope.

The fluid part of milk is composed of water, proteins, salts, and sugar. These are taken from the lymph that flows through the udder, by the cells lining the small alveoli and lobules. The lymph is made up largely from the blood, being the fluid part of it, with nourishment from the digested food eaten by the animal. The blood in flowing through the arteries and capillaries **finally** arrives at ves-

sels that are too small to allow the passage of the corpuscles, then, from the process of transfusion, the fluid part of the blood passes on out among the tissues which are filled with small spaces known as lymph spaces. In this way the lymph carries nourishment to the cells comprising this part of the body. These small alveoli or acini in the udder act as lymph spaces and are filled with lymph. The cells lining these alveolar spaces extract a large per cent of the solid matter and most of the liquid from the lymph, and mixes it with the fat cells that go to make up the fat of the milk. This mixture is then carried down through the various ducts to the galactophorous sinus where it is stored until the next milking time. The remainder of the lymph is carried back through the lymph vessels and finally into the blood circulation again.

The quantity of lymph produced by a cow in 24 hours is estimated at from 20 to 90 quarts, but this does not mean that this is all the lymph that is in the cow's body.

The quantity of water that the cow consumes influences the flow of milk slightly but to no great extent. The manner in which it does this we are not able to explain.

The fact that the lymph has a mixture of some substances digested by the cow will no doubt explain the manner in which some feed will produce a characteristic odor in the milk of the animal which has eaten it.

## CHAPTER XVII.

### DISEASES OF THE COW'S UDDER.

Diseases of the udder may be classed as two kinds; those resulting from external sources such as bruises, contusions, injuries by sharp pointed objects, and the like; and those that are due to internal conditions such as too rich feed and forced feeding in order to stimulate a heavy milk flow. These conditions may be infectious and non-infectious, such as infectious mammitis and simple mammitis.

Treatment of the diseases of the udder is so often unsatisfactory that it should be the aim of every dairyman to prevent them by proper care and attention rather than to wait until the disease is well developed and then expect successful treatment. It is an old saying "an ounce of prevention is worth a pound of cure." We believe, though, that the least prevention of a cow's udder from disease is worth more than all the cures that you can possibly employ.

The cow's udder is a very highly developed gland, composed of very sensitive tissues and

a network of blood vessels through which blood and lymph are carried and from which the fluid portion of the milk is secreted. A good milking cow has a most highly developed udder which is more likely to become deranged either through carelessness or from injury. A cow of this kind will usually demand a great deal of attention just before calving time, as the udder may become swollen, red, tender and hot to the touch, which indicates an inflammation. At this time milk will usually be found in the udder and should be milked out. The milking should be done as carefully as possible and should be repeated three or four times daily if necessary. The cow should have not more than half feed for about 10 days or two weeks before calving, and three or four days before this time she should receive a dose of some good laxative, also plenty of exercise in the open air.

Some cows have large, pendulous udders which are often injured when the cows get up or lie down, especially if the stall is too small. Injuries are sometimes sustained while the cows are in the pasture or when they step over high door sills and the like. Occasionally the udder is injured by coming in contact with a cement floor when no bedding is used. These wounds should receive attention, as they become very serious if the injury becomes infected. The treatment which we recommend at the end of this article for simple mammitis

will do very well for this class of injuries.

### **Bloody Milk.**

Due to the enormous flow of blood through the udder and the great number of blood vessels, we frequently have bloody milk in the heavy, rich milkers. Sometimes, the first thing that is noticed is a slight pink tinge to the milk when it is drawn and it will be somewhat frothy. Soon streaks of blood and small clots will be noticeable. As this is due to a congestion and a rupture of some of the small blood vessels of the udder, it becomes necessary to draw the milk with as little manipulation of the udder as possible. This condition is usually brought about by feeding large quantities of rich and sometimes irritating feeds in an effort to stimulate a heavy milk flow; therefore, the feed should be reduced to about one-half and the cow should receive a laxative. If it is caused by an injury, the same procedure should be observed. If large quantities of blood are observed and the udder is tender, it is advisable to use a sterile milk tube for drawing the milk for a while. The teat, and tube, should be sterilized with a mild antiseptic before the tube is used, or infection will be introduced which is worse than the ruptured blood vessel which is rarely ever of any consequence if taken care of properly as soon as it is noticed.

### Tuberculosis.

This condition can not be determined definitely by a physical diagnosis, but requires the tuberculin test to confirm the diagnosis. This disease is quite common in old dairy cows which have been heavy milkers. It manifests itself usually in hard tumorous masses of different sizes. Sometimes the udder will yield a thick heavy yellow substance which resembles pus which may in reality be a tubercular abscess, but more often it is a hard firm mass which can be very readily felt upon palpitation of the udder. When such a condition of the udder is found the presence of tuberculosis should be suspected and the tuberculin test should be immediately applied to confirm or disprove the diagnosis.

### Tumors of the Udder.

If the tuberculin test fails to show tuberculosis in those cows whose udders contain hard indurated masses that are discernible by manipulation, it is plain that we then have a tumor of the udder. These growths are usually benign in character in comparison to those of the human family which are usually malignant or of the cancer variety. Surgical interference is not practiced for this class of conditions and it is not often that medicinal treatment would be of much value.



### Suppression of Milk.

This condition will result from insufficient feed, debilitating disease, and ill health, but, occasionally, it will be seen in a cow which will apparently be in good health and will show no signs of any sickness or irregularity. This condition is caused by an affection or a temporary paralysis of the trophic nerves which stimulate the secretory action of the udder and it should be treated immediately. When this condition is first noticed, the cow gives only about half as much milk as she has been giving and in the very next milking she will give very little milk at all.

In our practice we have gotten better results from the use of one-half ounce fluid extract of *Nux Vomica* and one ounce of fluid extract of *Pilocarpus* or *Jaborandi*, same to be divided into three doses and a dose to be given every three or four hours. Milking the teats the same as though milk was being drawn will assist in stimulating the secretion of milk.

### Simple Mammitis.

Simple mammitis is a condition that is usually spoken of among cattlemen and dairymen as garget. It is a simple congestion of the udder. It attacks the cow in various ways. Its severity at times puts the animal off feed and raises the temperature several degrees, and may almost completely stop the milk flow. At other times it will be so mild as to

cause very little inconvenience. The frequent emptying and the kneading of the udder by a sucking calf's nose will sometimes be all the treatment necessary. The temperature in the simple congestion of which we are now speaking is rarely above two or three degrees. The milk flow is decreased to some extent and, as the disease progresses, the milk becomes watery and finally contains strings and clots. The udder is doughy to the touch. Reduce the feed and bathe the udder with hot water, after which it should have a thorough yet a gentle massage with one part of poke root, belladonna or spirits of camphor in seven or eight parts of lanolin or vaseline. If the udder begins to soften after several hours of treatment, it is usually a good symptom that the case is terminating favorably and that the function of the gland will be restored.

### **Infectious Mammitis.**

The cow affected with infectious mammitis will usually refuse to eat. The hair stands on end and the nose is hot and dry. The temperature is very high, as much as 106 Fahrenheit, and the animal usually walks with a limp. The respiration and the heart beat are greatly increased. The animal usually stands around much of the time as it is painful for it to walk, and it refuses to chew its cud.

It is inadvisable for the owner to attempt to treat this class of ailments and the best

thing to do is to get a veterinarian as soon as possible. The same treatment that we have outlined for simple mammitis should be used until the veterinarian can be had. The water that is given the cow if it be cold weather should have the chill taken off and the cow should be protected from the cold by blankets. The udder should be suspended with a large bandage. An animal so affected should be isolated from the other cows, and the caretaker should not attend to any of the other cows. It is very necessary in this condition that internal treatment be of the very best and this should always be prescribed by a competent veterinarian. The majority of these cases leave the cow without the use of that part of the udder that was affected. Many times it is necessary to amputate the quarter of the udder affected.

## CHAPTER XVIII.

### DISEASES OF THE COW'S TEATS.

Diseases of the cow's teats are of much importance to the cow owner because the cow sometimes forms bad habits while afflicted with such diseases. Permanently injured teats and a complication of the adjacent part of the udder often result in causing permanent injury and resistance to treatment.

These diseases may be divided into those affecting the exterior and the interior of the teat. They may be caused by predisposing conditions such as infection from bacteria that are always present, and from infection and inflammation that may spread from within outward during diseases of the udder. Exciting conditions such as use of mechanical instruments, pressure during milking, injuries from stepping on teats when getting up or lying down, stepping over high sills, injuries from bushes, shrubs and the like in the pasture and from standing or wading in dirty, filthy mud or water or through manure pits may also cause diseased teats.

Those cows having large, pendulous bags and

large teats often step on them when getting up and lying down. After milking with a wet hand or after calf sucking, the cold, damp air will occasionally make them sore. Some young heifers have an abnormal udder or teat development, others have teats in which there is no milk duct at all. Although some quarters of the udder with ductless teats secrete milk the same as the others, it is necessary to make artificial openings through the teats and dry her up and beef her. In some teats the milk duct is closed from the growth of the lining membrane and in others there is no opening between the milk sinus and the milk duct. Some of these last named cases are amenable to treatment and in others it is unsatisfactory.

It should be borne in mind that some conditions of the teats can not well be treated when the cow is giving milk, but only at the dry period.

### Chapped or Cracked Teats.

This condition may be caused by one of several causes, such as sucking of the calf, milking the cow with wet hands, wading through wet grass or through mud and water, or from lying on wet bedding. It is then brought about by the chilling of the skin by the cold air.

This condition varies greatly, owing to the time that has elapsed, the manner of treatment and the sensitiveness of the skin covering the teats. At first it will be but a dryness and redness of the skin with marked tenderness evi-

denced while milking ; but, if allowed to go along without treatment, the manipulations during milking and the other influences such as moist, damp atmosphere will sometimes result in deep cracks or fissures on the surface of the teats, often involving the deeper layers of the skin.

If this condition is recognized early, the teat should be painted after each milking with a compound tincture of benzoin, using a camel's hair brush. If the condition is pretty well advanced before treatment is well applied it is then well to use an antiseptic solution such as germicidal discs in solution of 1 to 1,000, filling cup with the solution and then holding against the udder allowing the teat to be suspended in the solution for at least five minutes after each milking and then paint with the following: One-half ounce tincture of iodine in two ounces (by volume) of glycerine, using a camel's hair brush. If there are any scabs formed, the solution just recommended will remove them and besides it is a very good antiseptic. It is sometimes necessary to use a sterile milk tube to draw the milk, as the teats are too sore to permit milking.

### **Teats Blocked by Casein.**

Due to unhealthy conditions of the udder, a teat will occasionally become blocked with coagulated casein which becomes very hard and dry from the loss of the liquid which it ordinarily contains, can often be moved up and down in the milk duct of the teat and often removed. If

unable to remove, a small quantity of almond oil which has been previously boiled should be injected into the teat and then, after a few minutes, it can usually be removed with the aid of a spring dilator.

### **Warts on the Teats.**

Warts give more or less trouble when found on the teats and are very detrimental to an animal that otherwise might be a show animal. Possibly the best way to rid the cow of them is to snip them off with a sharp pair of scissors and then paint the spot with tincture of iodine after each milking. This should be done when the cow is dry. If done while the cow is giving milk, it may be necessary to draw the milk with a tube for a few days.

### **Calculus or Stone in the Teats.**

The teats of cows have been known to contain calculus or stones which are formed from the calcareous salts that are found in the milk. If it is impossible to remove them by the use of a spring dilator, it will be necessary to have a veterinarian remove them surgically, preferably best be done when the cow is dry.

### **Tumor in the Teat.**

We occasionally find a teat that is obstructed with a warty or tumorous growth and this may occur anywhere between the orifice to the base of the teat. It is advisable to call a veterinarian

to handle these conditions as it is most times necessary to remove them surgically, and this can best be done when the cow is dry.

### **Closure of Milk Duct by Lining Membrane.**

This usually takes place while the cow is dry and is not discovered until she freshens. It sometimes is possible to draw some milk from the teat that is affected, as the closure is not always complete. We have been able in a few instances to open the milk duct by working the milk tube from side to side and then in a circle. If this is not successful or is impossible, it is then necessary to take a small bistoury which is made for that purpose and cut through the thickening in at least two directions. Keep this open by a spring dilator until healing has taken place.

This condition is caused, no doubt, from an inflammation within the milk duct which brings the walls in apposition and they unite, either wholly or in part, thus closing the milk duct, either completely or partially.

### **Stricture of the Teat.**

This is a condition which to the average cow owner seems very simple, yet we are frank to say that in our experience it does not yield satisfactorily to the modern methods of treatment that are now employed by practicing veterinarians. We believe, though, that they are as good as can be employed for such conditions. It is a very common thing to see a severe case of mam-



mitis follow interference that is practiced in an effort to relieve a stricture of the teat.

Stricture of the cow's teat does not often close the milk duct entirely, but, when it does, it is usually in young heifers that have never calved before. If the stricture is near the end of the teat, the teat will fill with milk quite readily, which will either draw in a very small stream or will flow in several small streams in a sort of a spray. If it is near the top of the teat, it will fill very slowly, but it can be drawn from the teat quite easily.

A stricture located in the end of the teat will often yield to repeated dilation. Sterilize a teat dilator and wash the teat with an antiseptic, insert the dilator into the end of the teat and dilate to the proper opening, then let it remain in this position for a couple of minutes, after which the dilator should be removed for a couple of minutes. This procedure should be performed five or six times, at intervals of two or three minutes rest between dilations, and treatments should be continued for several times at intervals of two or three days. A stricture that is located high in the teat should be treated only by a veterinarian, and then not until he has explained to the owner of the cow the danger of complications that may injure that quarter of the udder. It is strictly surgical in the majority of cases, but in a few cases where the stricture is not too high up a course of dilations are worthy of trial.

### Absence of Opening.

We sometimes find heifers that have a perfect udder and teat development, except that the external opening of the teat is absent. There is usually present a small depression where this should be. By means of a heavy needle or a small stylet the skin may be punctured, after which the needle should be turned from left to right several times, using care that it is not pushed deeper into the tissue than laid aside, while a sterile milk tube is gotten ready, the opening made by the stylet or needle is enlarged by a small curette, after which the tube may be pushed through the opening into the milk duct. The opening should be kept open, until healing has taken place, by a dilator or a small piece of gauze soaked in glycerine, allowing it to protrude so that it may be removed in 24 hours.

### Fistula of the Teats.

This condition is usually due to an injury but may be the result of mammitis or other conditions affecting the udder. It is sometimes the result of cutting off of rudimentary teats. They may have a milk duct and in that case they may continue to drip milk continuously. This condition is very refractory to treatment and it requires surgical treatment to affect a cure. If it has been of longer than one month's standing, it is well to defer treatment until the cow is dry; if not, good results may be obtained at any time.

## CHAPTER XIX.

### RETENTION OF THE PLACENTA.

This is a matter which many stockmen do not regard with due seriousness, possibly because they have not had an opportunity of observing the various evils resulting from the failure of the cow to clean properly.

When any great portion of the placenta or afterbirth is retained in the uterus for any length of time after the cow has given birth to a calf, there usually develops a varied chain of symptoms, which are very noticeable, often serious, and many times fatal. There may occur a simple catarrh of the uterus in which the discharge is of a mucous consistency or it may be a thick, heavy pus sometimes containing streaks of blood. There may be a cachexia, unthriftiness or a wasting away, or there may be an absorption of the septic or poisonous matter, known as septic metritis, which often times result in death or barrenness of the cow.

A portion of the afterbirth may remain after the cow has apparently cleaned normally, and we sometimes find shreds or portions remain-

ing after it has been removed by the inexperienced or sometimes when the veterinarian has removed it.

When the simple catarrhal condition of the uterus follows this retention, the tail and escutcheon are soiled with a mass of filth which is composed of pus and dirt, and when the cow is in the recumbent position a quantity of pus is usually noticed to flow from the vagina. Such cows in a herd can usually be detected from the odor of this discharge. Milk from a cow in this condition should not be used for human consumption. A veterinarian can do little in the way of treating this condition unless he is called early, as the mouth of the uterus will contract so that it is impossible to use mild antiseptic irrigations. It is unsafe to use such irrigations unless it is possible to syphon off all the solution, because if any is allowed to remain it may produce such irritation and straining that an eversion of the vagina may take place.

With the resulting cachexia or unthriftiness, that we have spoken of, the cow gradually loses flesh, her hair is rough, she gives very little or no milk, there is a loss of appetite, she will not respond to any extent to feeds or to tonics, and she gradually grows weaker and becomes a living skeleton. Sometimes after a year or so she regains some of her former health, but this is unusual. Generally the cow wastes away and dies in a few weeks.

In other cases the cow absorbs these septic or poisonous products and this condition is known as septic metritis or pyo-metra and is, commonly speaking, an inflammation of the uterus, due to the absorption of the poisonous material within it. After several days the cow loses her appetite, respiration becomes labored, and the temperature may reach 105 or 106 degrees Fahrenheit. With early and persistent treatment some of these cases recover, but when they do recover they usually leave the cow sterile and this is a great loss to the owner.

With any of the above conditions it is not unusual to have a sterile cow after recovery, but sometimes after the catarrhal symptoms of which we have just spoken the cow may be gotten with calf with persistent service or at other times after the lapse of several months up to a couple of years. If it is not possible to get her with calf within two years after the above condition, very little hopes should be entertained of later accomplishing this.

The practice of tying heavy objects to that part of the afterbirth that is usually found protruding, in an effort to bring it away, should not be allowed as it usually tears the afterbirth so that a part of it remains. The inexperienced can often do more harm than good in these cases, and it is poor policy to allow them to attempt this unless a veterinarian can not be had. In our experience we find it is

usually best to wait for about 48 hours in most breeds of cattle before removing the after-birth, but in Jersey cattle it is good policy to wait many times for about 72 hours. It is practically safe to wait in any cow for at least 24 hours.

Many people are of the opinion that there is some way of preventing this retention, and that there is also some medical agents that can be given that will cause the cow to pass them, but there is none as far as we have ever been able to learn.

Remember that early intervention is to be recommended if you are sure that the cow has retained afterbirth, that veterinary help will be of little account unless it is secured early. Better be safe first than to take any chances of losing a good and valuable cow.

## CHAPTER XX.

### LUMPY JAW.

This condition is also known as wooden tongue from the fact that when it affects the tongue of cows, their tongues become very stiff.

This condition is usually noticed only when it produces a swelling externally and this is most times on the angle of the jaw, but frequently it affects the muscular tissues lying between the jawbones. It frequently occurs internally, but it is doubtful if it can be diagnosed in the living animals; it is no doubt many times diagnosed as tuberculosis.

This is a disease of young or middle aged cows and rarely attacks older ones. This growth that is noticed is smooth, firm and very slowly increases in size, until finally it seems to attach itself to the bone. Many of these growths after a time get soft and break open, discharging a peculiar pus, very much resembling the marrow of the bones. Occasionally there will be as many as four or five of these openings.

This is considered as an infectious disease, but it is not often that we find more than a single

case or at best a couple of cases in any one herd. It is thought that it is caused by a fungus growth that grows on the grasses and grains that are usually and commonly eaten by cows and that it gains access to the region of the head through injuries of the gums and mucous membranes of the mouth, and through diseased teeth, and also when the young shed their first set of teeth.

When this condition affects the tongue of cows it may progress for some little time before it is noticed; after a time the animal will be noticed having the mouth slightly opened and the saliva will be dribbling from her mouth. It will be noticed that she has difficulty in swallowing, and watched, it will be observed that she can scarcely eat.

If the tongue be examined at this time it will be found to be stiff and hard. Treatment of such cases must be prompt or the animal may die of lack of nutrition.

It is almost marvelous the results that may be obtained in treating this condition in the greater number of cases; if treatment is begun before the bony tissues have become diseased we have almost one hundred per cent of cures; after the bones have become involved treatment is more difficult.

The treatment that gives such results in these conditions consists in administering from one to two drams of potassium iodid three times each day. This is dissolved and given in water as



a drench. The following is a good way to have it prepared: two ounces potassium iodid dissolved in eight ounces of water and then give one tablespoonful in a little water as a drench three times daily. The external swelling should be painted twice daily with tincture of iodine.

In some cases it requires five or six weeks to effect a cure. In those cases affecting the tongue there is apt to be a recurrence unless the treatment is persisted in for this length of time. In some cows we notice, what is termed Iodism and that is a condition resulting from an overdose of the potassium iodid. The animal's eyes water, there is a catarrh of the nose and a loss of appetite; when such symptoms occur the treatment should be discontinued for three or four days until these symptoms have subsided and then the treatment should be repeated as before. It is best to give sufficiently large doses of potassium iodid to produce this condition several times in those cases affecting the tongue. Cases that will not respond to this treatment in five or six weeks should be regarded as hopeless as far as successful treatment is concerned.

It should be borne in mind that when potassium iodid is given to cows that are far advanced in pregnancy that it may occasionally produce an abortion and that it will very materially affect the milk flow and sometimes will almost check it altogether; the milk should not be used while the cow is under treatment

## CHAPTER XXI.

### MILK FEVER.

Milk fever is of common occurrence among high producing dairy cows. This was considered a very serious disease a few years ago, and in the majority of cases the animals died. To-day this condition is very rarely fatal.

Treatment for milk fever is strictly empirical, but it is certain that, even if we understood the causes of this condition, we could not treat it any more successfully than we do now. Veterinarians can handle the trouble quite successfully. There is no other disease in which the symptoms develop so rapidly and become so serious in such a short space of time as do those of milk fever, and yet with our modern treatment the recovery is just as rapid and mystical as is the development of the disease.

This is a disease that cannot be determined by symptoms alone, but the history and surrounding circumstances make diagnosis possible. From wide experience the cow owner is able to know that the case at hand is milk fever and we may say that he arrives at his conclusion by

intuition, but to the man who has seen several cases of this kind there comes to mind a series of symptoms that have in all probability been unseen by the attendant.

This is a disease of young cows, usually those having had one or two calves and, while it does affect old cows occasionally, it is not at all common. More often it follows an easy parturition and is rarely seen in cows that have experienced much difficulty in giving birth to their calves. Cows that are affected are invariably in good flesh and thrifty and are heavy milkers. The disease makes its appearance in the majority of cases within one to three days after the cow has calved, but has been known to occur before birth and also as long as four or five weeks after calving. These latter two conditions are uncommon.

As a rule the cow is down when she is found by the attendant, but the line of symptoms that would be observed are pretty much as follows: The cow refuses to eat and stands without paying any attention to feed or surroundings. If she moves it is with a stiff, wobbly gait and it is noticed that she cannot control her hind parts but weaves and staggers as she walks. The muscles begin to quiver and she shows all signs of having a chill. She will shift her weight continually from one leg to the other. In the course of an hour or so at most and often within the time after the cow is seen she goes down; she lies on her breast, but is unable to get up; she

seems very drowsy and rapidly gets worse until soon she is insensible and totally unaware of things that are going on about her. Her head is turned on her side and in this position she lies. Breathing is heavy and she quite often moans and grunts as if in great pain, but this is not due to pain but rather the result of the insensibility that is present. There is very little milk to be found in the udder and the secretion of saliva is very scanty. There is no movement of the bowels or passing of the urine during this time.

Warm water should be secured and an antiseptic solution should be prepared in which the milk fever apparatus can be cleaned. The cow is rolled into such a position that all the teats can be worked with by the operator; what little milk may be in them should be milked out. The teats are then washed carefully in the antiseptic solution and the treatment is applied by means of a milk fever apparatus, which consists of a milk tube to which is attached a small rubber hose. In the center of the hose is a small metal chamber containing absorbent cotton saturated with a good disinfectant and on the other end is to be found a small rubber bulb or small metal pump. The milk tube is inserted into one of the lower teats and the teat is tensely distended with air; then the corresponding teat is inflated, and then the other two. To keep the air from leaking out of the teats, push the end of the teat in with

the fingers. Do not use strings or rubber bands to keep the air in the teats.

This treatment is known in most districts simply as the air treatment, but originally these cases were treated by injecting into the udder solutions of potassium iodid in water, and then a salt solution, and this was followed by pure oxygen gas, to be later replaced by simple atmospheric pressure.

The cow should be treated just as soon as possible after being found and, even when she has been neglected so long that treatment might seem to be useless, she may recover. We have had cows in our practice that would recover perfectly after they were apparently dead. So in this condition as long as there is a spark of life there is good hope for recovery.

Under no conditions is it advisable to attempt to give a cow suffering with milk fever any medicine by way of the mouth. The throat is partially paralyzed and the medicine might pass into the lungs and kill the cow.

In a short while after the cow's udder has been inflated she will begin to regain her senses; her breathing gets better and she gets brighter; after a while she will straighten up and swallow a few times and begin to act natural. As soon as she can be induced to attempt to get on her feet, she should be helped, and if she succeeds in getting up she should be steadied for a few minutes until she can stand alone.

A cow that lies stretched on her side when in

this condition sometimes bloats badly and in this case should be tapped. It is better still to prevent bloat by keeping her propped up on her breast until she regains consciousness.

After the cow is on her feet she should have water but no feed for the first ten or twelve hours; at the end of this time she may be milked. No other treatment is necessary. If, however, the cow does not regain her feet within four or five hours inflate the udder as before.

## CHAPTER XXII.

### STERILITY OF COWS.

Sterility is one of the biggest economic problems that the dairymen and large breeders have to solve. This condition is steadily on the increase and is found in the dairy districts and especially where contagious abortion is prevalent.

Sterility produces losses to dairymen and breeders in a number of ways. The dairy man who has cows that are sterile suffers greatly from a lessened production as he is unable to get the cows with calf and the result is a greatly reduced milk flow. The dairyman that has good, pure-bred animals suffers another serious loss in as much as he secures no offspring from his well-bred cows. The calves from many cows are worth very much more than all the butter and milk that they would produce in one year, which is the usual length of time between successive freshening.

The percentage of sterility in the cows of the United States cannot be very closely estimated, but it would probably be somewhere in the neighborhood of ten per cent.

Not all animals that we class as sterile are

permanently so, as many of them will breed again after being properly treated. Others, however, can never breed, as they are incurable and this is the reason that none save a very careful, studious veterinarian can become qualified so that by examination he can inform the owner which animals can be cured and which should be sent to the slaughter. The quack will soon get in trouble when he attempts to deal with this condition.

The value of the cow has a great influence upon the decision of the veterinarian in cases of sterility, also the length of time that has elapsed since the last calving. Cows that are but grades and not exceptionally good ones will rarely be worth the treatment. The most of these cows must receive weekly treatments and from fifty to seventy-five per cent of them will require from three to six treatments. A few will recover after a greater number of treatments, up to six months, but the number that will recover and breed again after they have been treated over six months is very small indeed.

### **Causes of Sterility.**

Sterility may be caused by excessive feeding of cows for show purposes, lack of exercise, debilitating diseases, excessive fatness, etc. The removal of these, when they are the causes, usually brings about the return of the heat periods.

Abnormalities of the genital organs, that is, the vagina, uterus, ovaries fallopian tubes, etc.



Disease of the ovaries, tubes, uterus and vagina and cysts or tumors in any of these organs. But by far the most common cause of this condition is contagious abortion.

Contagious abortion produces sterility by causing a diseased condition of the uterus or some of the other genital organs. This is closely associated by an inflammation of the vagina, which is easily transmitted from the cow's contact with infected stables and bedding and also by the bull during the act of coition. The only way this condition can be remedied is by disinfecting the stables and local treatment of the vagina of the cow and the prepuce of the bull.

### Diseases of the Ovaries.

While it requires a qualified veterinarian to intelligently diagnose the diseases of the cow's ovaries, yet there is a train of symptoms that are usually indicative of a diseased condition of the ovaries, and they are the absence of the heat periods, irregular heat periods, or the animals are continuously in heat. There is also in the majority of cases a relaxing of the sacro-sciatic ligaments, which are just to the side and a little forward from the base of the tail and this gives the backbone a humped up appearance. The vulva may also be relaxed and flabby and appear larger than normal.

Occasionally only one ovary will be diseased, but usually both. These diseases are brought about by the infection traveling up from the

uterus through the tubes to the ovary. This infection may be from a piece of retained afterbirth or from a diseased uterus.

### Diseases of the Tubes.

The fallopian tubes are very small tortuous tubes that lead from the horns of the uterus to the ovary and they conduct the germ from the ovary to the uterus. Due to infection gaining access from a diseased uterus or from a retained afterbirth we often have a very badly inflamed thick-walled infected canal that will prevent the cow from getting with calf. This condition can only be treated by a veterinarian and requires a number of special instruments that are expensive.

### Diseases of the Uterus.

By far the cause of the greatest number of sterile cows is a diseased uterus. This may be a catarrhal inflammation or it may be in which there is no discharge or it may be a severe inflammation in which there is a mucous discharge mixed with pus that flows from the vagina at intervals. This pus may be retained for some time in a few cases. About 90 per cent of cows that abort have at least an inflammation of some sort of the uterus and every cow that aborts should have proper treatment by a veterinarian that understands the treatment of this condition. It is not necessary to treat the cow at time of calving, but if the afterbirth is retained it should

be removed and in from ten to fourteen days after calving the treatments should be commenced and continued until the uterus is normal. Every cow that aborts should have uterine treatments without a single exception and then there would be a very small percent of them that would be permanently sterile.

### **Quarantine.**

Every cow that aborts should be removed to a separate quarantine stable and the stable should be carefully and thoroughly disinfected. This cow should be kept here and should be treated weekly until the uterus appears normal and then bred. In no case would it be well to breed her before the expiration of two months.

### **Who Can Treat Sterility.**

This condition can only be treated intelligently and successfully by the careful, painstaking veterinarian who has given a great deal of study to this condition and should not be attempted by anyone else, as there are several pitfalls into which the empiric will fall that would be worse than sterility as they would many times result in the death of the animal.









