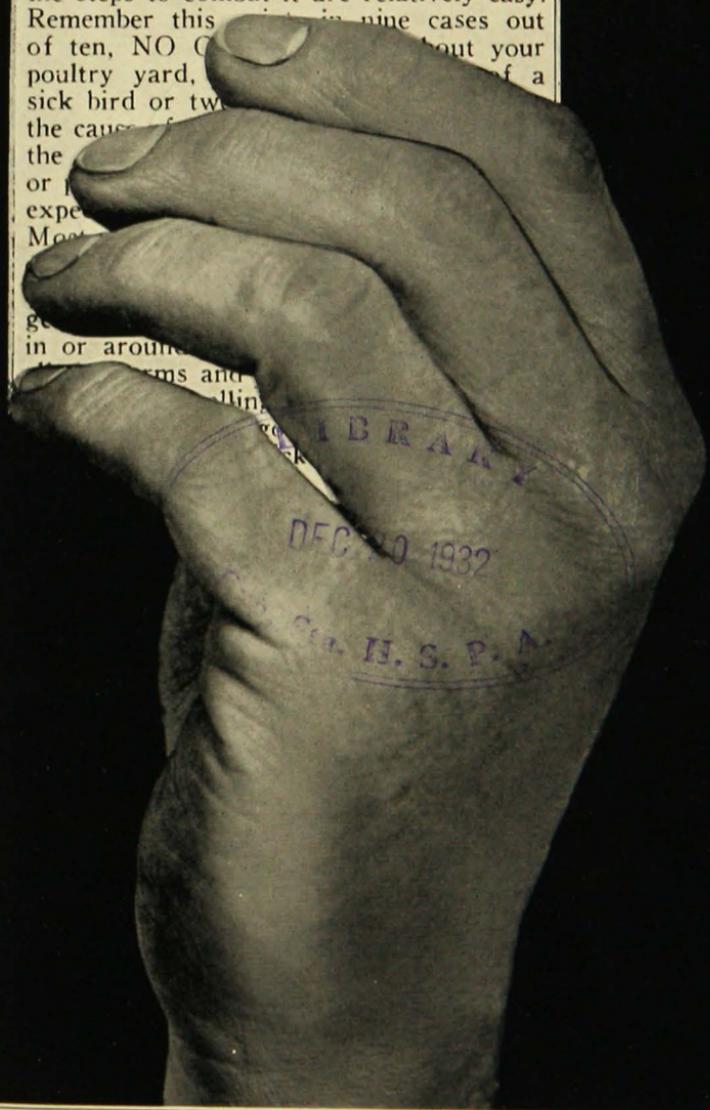


Timely Truths About Poultry Troubles

By DR. W. A. BILLINGS

SOME PARTING SHOTS

When trouble comes to your flock—don't try to make it complicated. The chances are if the disease is recognized, the steps to combat it are relatively easy. Remember this: in nine cases out of ten, NO ONE can get into your poultry yard, and if a sick bird or two are the cause of the trouble, the cause is not the flock or the experience. Most people get in or around the pens and



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HEN HYGIENE

A great many people who raise chickens have more or less trouble with some of the common poultry ailments. However, these are not numerous—all told, a half dozen will usually account for 90 per cent of the losses. This little booklet will not attempt to cover the **WHOLE FIELD** of chicken diseases. Only those of considerable importance will be discussed. Neither is it a "**DOCTOR BOOK**" and prescriptions will be few and far between. We will try to help you cut down losses from certain diseases and give you information which should help you to **PREVENT** trouble in your flock. In short, this will not be a lecture on how to **CURE ONE SICK HEN**. It is never advisable to maintain chicken **HOSPITALS**. As a rule, it does not pay to fuss with one or two ailing birds. A sharp hatchet is often the best cure. Some women, and men, too, like to smear vaseline or olive oil on birds' heads and **GARGLE** their throats and give castor oil or epsom salts. The sick birds are frequently kept in a wooden box back of the **KITCHEN STOVE** and even tho a few finally recover, it takes a lot of time and is hardly worth the effort. The **INDIVIDUAL** treatment of sick birds is very unsatisfactory and most flock treatments are **NOTORIOUSLY** unsuccessful.

The writer does not know of **ANY** chicken disease that can be cured or even relieved by this everlasting "putting stuff in the drinking water." In fact, many times a great deal of harm is done. The owner is usually worse off because instead of adopting **DRASTIC CLEAN UP** methods, he is inclined to depend on the colored drinking water for help and the trouble continues until the entire flock is riddled. Many are the records of entire flocks **ACTUALLY KILLED** by using certain harmful drugs in the guise of cure-alls. Most quack remedies are worthless and rely chiefly upon the **GULLIBILITY** of the buyer and **OUR NATIONAL OPTIMISM** for success. The author has never known of one that really cured anything from that **ANCIENT** disease "pip" on down the list. Try to be reasonable about these things. It is far better to consult your local **VETERINARIAN** than to take patent medicine peddlers into your confidence. Very likely you know more about the trouble than they

**Don't Pass Up
This Section.
It's Important.**

**Let's Forget
Pills, Powders,
And Potions.**

do—only YOU don't know it. Such diseases as tuberculosis, cholera, coccidiosis, and bacillary white diarrhea are ABSOLUTELY incurable with any known medicine—YET there are hundreds that SUBTLY guarantee to cure them. Why not forget them—save the money—find out what the disease is and then LEARN the best way to stop further losses. This is hard enough as it is without expecting a modern miracle. Unfortunately, it is a fact that we have few medical aids to combat common poultry diseases. As a result of this, the farmer often buys fake cures as a last resort.

OPEN THE DEAD ONES

If you are having trouble with birds getting sick or dying—don't immediately consign them to the MANURE PILE or don't let them rot in the chicken yard. There are VERY FEW diseases which can be recognized by merely glancing at a SICK bird. Many peddlers can do this, but their guess is ALWAYS questionable. If you do not have the help of someone skilled in this, it is usually best to open a bird yourself and try to discover the cause of the trouble. You won't be able to identify all of them, of course, but you should be able to recognize such diseases as tuberculosis and worms. Many farmers and their wives do not hesitate to clean a bird for the dinner table, but detest opening one that has died from disease. Booklets such as this usually have pictures of diseased insides of chickens and you won't be able to compare unless the bird is opened. Lay the bird on a box or table and proceed to remove the entrails, trying all the time not to make a mess of it. After you have turned back the breast and exposed the internal organs, the liver greets you first. It is reddish in color—some say mahogany. Examine it carefully for signs of tuberculosis or blackhead. The spleen may elude you. It is located directly under the liver and is of the same color. It is round and varies in size up to a small pullet egg. T. B. may be noted here, also. Then remove the liver and intestines. With a sharp pair of scissors, open the intestines FROM END TO END. Worms may be found here—both round worms and tape worms. Remove and open the crop and GIZZARD. Open the mouth—examine it carefully and then cut right down

**Learn To Know
The Insides Of
A Hen. It Isn't
So Hard.**

through the WINDPIPE, keeping a weather eye out for yellow patches of CANKER.

Each year we receive hundreds of letters from folks asking what to do for their sick chickens. In their letters they simply say their hens are dying and ask for some medicine to cure them. This is nothing more or less than a GUESSING CONTEST and advice given under such circumstances is not very valuable. So be sure to look the sick birds over carefully—inside and out—then consult pictures in this or other poultry-disease bulletins and try to piece the puzzle together. If you are unable to help yourself and can not secure the advice of a competent veterinarian, write us a letter describing everything you have observed.

Nearly every other letter received asking for advice about diseases in poultry usually begins by stating that the birds have BOWEL TROUBLE. There's a question for you. Bowel trouble is NOT A DISEASE in itself. The term is generally used to describe a bird having diarrhea. Diarrhea is merely a SYMPTOM of several of the common diseases of chickens. It will not tell anyone what the disease actually is. Chickens may have a diarrhea when affected with tuberculosis, cholera, coccidiosis, or worms. Even chilling, overheating, and overcrowding of chicks may bring on a diarrhea. Faulty feeding will, too. Another thing to bear in mind is not to put too much stress on the COLOR OF THE DROPPINGS. This color means little or nothing and may be changed at will by varying the diet of the birds. In chicks especially, many try to identify a disease by the color of the droppings—if it's red, it's coccidiosis—if it's white, it's white diarrhea—if it's yellow, it's tuberculosis and so on. While it is true that colored droppings are frequently associated with certain diseases, one can not depend on this.

Then too, we have the HEN'S APPENDIX to examine. You often hear of it spoken of as the "blind gut" or caecum. It is a two-pouched blind sac in the lower part of the intestines and only a few inches from the rectum or cloaca. These two pouches are the home for the "pin" or caecal worm of poultry. The effects of coccidiosis and blackhead are also seen here.

I hope by these brief suggestions that you will be encouraged to open dead birds as a SAFE and SANE means

**A Peek at the
Insides Is Better
Than Any
Symptom.**

**Is Bowel
Trouble a
Disease?**

of recognizing at least a few of the common poultry diseases. All the talk in the world will not help you unless the bird is opened by someone. If you are too fastidious or think the job is TOO MESSY, take one to your veterinarian or send one to the Veterinary Division at University Farm, St. Paul, Minnesota.

TUBERCULOSIS

**Tuberculosis
Not Inherited—
Caused by
Germs—Not
Bad Air or Food.**

Poultry tuberculosis is the most widespread of all diseases in Minnesota. It is also one of the easiest to recognize and there is NO EXCUSE for anyone to pass it by. Other names such as spotted liver, consumption, going light, and bowel trouble are often applied to it. It is also frequently referred to as "avian T. B." Tuberculosis in chickens is not a LUNG DISEASE as so often seen in man and some other animals, but rather a disease of the digestive organs involving the liver, the spleen, and the intestines. As you would suppose from this location, the GERMS causing it pass out through the droppings by the MILLION. Tuberculosis germs can be seen only with a microscope. The germ-filled droppings pass out on the ground, the floors, and even in the feed hoppers and watering vessels. Healthy birds then SWALLOW these deadly microbes when they eat or drink. Early hatched birds seldom show evidence of the disease before late fall or winter. It is generally believed that chickens do not become infected from tuberculous cattle or hogs, but may transmit their type of the disease to them. There has been some talk that T. B. may be carried through the eggs and thus infect both man and baby chicks. Recent experiments at the University of Minnesota and other places would indicate that eggs even from known tuberculous hens are not a serious source of infection. Avian T. B., therefore, is NOT INHERITED as many think. Practically all birds become infected by EATING the germs with their food and water.

**The Packer
Has Started
Something.**

In these days of canned chicken, tuberculosis is coming more and more into the LIMELIGHT. Packers who make a specialty of canning chicken are finding that Minnesota flocks are badly infected and unless something is done to combat the disease we may find ourselves discriminated against in favor of other sections of the country where the disease is not so widespread. Modern methods of canning chicken call for inspection just like other

livestock products and diseased birds must go into the "tank." This means a loss, and it behooves the grower to get busy and get this disease under CONTROL. With improved means of refrigeration, it won't be long until poultry will be sold to the public "drawn," and no longer will the consuming public be forced to buy a "cat in a bag." Inspection will change all this and force the grower to clean up the farm flock. It can be done, too. T. B. is an UNDERHANDED disease in that it proceeds slowly and the losses do not become SEVERE until practically the entire flock is affected. If the disease was a bit more

SHOWY and killed birds rapidly, perhaps we would be inclined to get more excited about it. Do not try to recognize tuberculosis just by LOOKING at sick birds. Yes, they do have a few characteristic actions, but these are not sufficient to do more than guess. Quite a while after the flock becomes infected some of the birds are noticed to be falling off in their



Fig. 1. Photograph of a Tuberculous Fowl
The liver is enlarged and spotted. This illustration also shows the proper way to open a dead bird.

APPETITES and a few of them may appear LISTLESS. Their movements are SLOW and they are easily caught. As the disease progresses the COMB and WATTLE become PALE. Diarrhea may be seen and the feathers about the VENT may be matted. The bird now becomes very thin. The breast bone is easily felt, owing to the WASTING AWAY of the muscle covering. The average handler frequently calls this condition

**Carcass
Inspection of
Poultry Not
Far Off.**

**How to Know
Tuberculosis.**

**Cures for
Tuberculosis
Worthless.**

GOING LIGHT. If a bird showing these symptoms dies or is killed, the liver is found to be much enlarged and dotted with YELLOWISH-WHITE SPOTS of varying size and number. These spots may also be found on the intestines as yellowish lumps or WARTS. They appear as GROWTHS on the outside of the bowel. The SPLEEN, that small, round, marble-shaped organ located underneath the liver may be enlarged and contain the same yellow spots. If these growths, or lumps, are cut with a knife you may sense a gritty feeling as the knife passes through them.

**Method of
Control or
Eradication.**

There is NO CURE for birds affected with tuberculosis. Preparations guaranteed to bring about a cure should be branded as FRAUDS. All efforts should be directed to weeding out the sick birds and stop the further spread of the disease. There are THREE WAYS to control and PERHAPS eventually eradicate tuberculosis. First—if the flock is small and not of great value from a breeding standpoint, it will likely be best to destroy the entire flock and start over the following spring with healthy baby chicks. In the meantime the henhouse should be carefully cleaned and disinfected and, if at all practical, moved to new ground. Do not try to clean up the soil about the chicken house by SPREADING LIME on it. This is little short of useless. Deep plowing and the action of sunshine will accomplish a lot, but if at all possible—move the henhouse onto a new clean spot. It is FREELY ADMITTED that this moving-the-house idea will not meet with widespread approval, but that doesn't reduce its desirability any. Second—if the flock is standard bred and valuable from that standpoint, the TUBERCULIN TEST may be applied in much the same way as in cattle. The test is best applied by a veterinarian and works splendidly. It is, however, foolish to test a flock and then expect no more birds to die. The test merely picks out the SPREADERS. Regular clean-up methods must be used along with the test or no good will come of it. See that the house is well scrubbed and disinfected. If the floor is dirt, the surface to a depth of several inches should be removed and then replaced with clean fresh dirt. It is quite easy to clean a cement or tight wooden floor. Plough up the soil about the henhouse, if it is found impossible to move the building. Disinfect FREQUENTLY all drinking and feeding utensils. You have no doubt decided by now that

ALL THIS IS TOO HARD to do, so why not just pull up stakes and have a general shake up. The writer knows very well that many objections will be made to this second plan on the ground that such a program is entirely out of the question for the BUSY farmer and his wife. Very well—why not try this last and BEST of plans. Here it is.

This calls for a LOT of courage and you will have to burn all your bridges behind you. If it should be fall or winter as you read this and you are having considerable losses from tuberculosis, you may clean house as outlined in Plan 1 and make a resolution to DODGE the trouble next year. You can prevent worms and coccidiosis at the same time, too. This plan is not a half-baked idea, but one that has ACTUALLY been carried out on hundreds of Minnesota farms. To begin with, you should use MOVABLE brooder houses for the artificial rearing of the baby chicks. Haul the brooder house 'way out from the farm buildings—on alfalfa if possible. Fence in this young and growing flock of HEALTHY birds to keep the old hens away from them and to keep them from wandering back to the farmhouse and old chicken ground. This is done to avoid worm infestation as well as tuberculosis. It will also aid in preventing the dreaded COCCIDIOSIS. Keep this young flock in their yard away from the farm buildings until October 1st. This yard should of course be changed whenever it becomes dirty. In the meantime you will have adopted mash feeding as well as scratch feeding for the birds in order to develop them for early fall egg production. When October rolls around, if you have any of last year's birds left, they may be disposed of. The henhouse should now get a THORO cleaning and disinfecting. Spray the inside with CARBOLINEUM to prevent mites, while you are at it. The young clean flock is then moved into this SPICK and SPAN house all ready to start in the fall laying season. If this plan is carried out, the losses from T. B. will be little or nothing. We heartily recommend that you try it. Others have, and have liked it. Leaflet No. 21 has been prepared describing this plan more in detail. It will be sent to you on request.

**How to Make a
Real Clean-up.
It's Easy, Too.**

ROUP

For some years there has been more or less disagreement among scientists about ROUP, CHICKEN POX, and CANKER (diphtheria). Some have held that roup,

**Halitosis Might
Be a Good
Name for Roup.**

and canker are one and the same disease; others have stoutly maintained that they are distinct diseases and in no way associated. Without trying in any way to settle the matter definitely, we will discuss roup and canker separately. Roup we will consider that disease which affects the head and eyes of birds of all ages. It is a very common INFECTIOUS disease. In some flocks only a few birds may be affected and cause no great concern; in others the entire flock may be involved. Roup usually shows itself first as a slight COLD in the head. A few birds may be seen to SNEEZE and there may be a STICKY DISCHARGE from the nose. This frequently gums the nostrils shut. On entering the henhouse in the morning when the sun shines on the birds, the caretaker may notice a GLISTENING BEAD of moisture in the eyes of some of the birds.



Fig. 2. Roup in Fowl
Note swollen eye and lid gummed shut.

This is often the first symptom and may pass unseen. After the sneezing stage, the eyes may become swollen and the eyelids glued together. When the lids close, the whole side of the face, including the eye, often bulges. One might imagine the bird had been CLUBBED. Upon examination, the upper part of the MOUTH and THROAT may be filled with a "gooey" mucus. This

causes the birds to make a RATTLING sound at nearly every breath. Birds may stand around shaking their heads in a futile attempt to dislodge the accumulations in the nose or eyes. When the disease proceeds this far, many sick birds are blind and may either SUFFOCATE or starve to death. Roup has a characteristic odor—it lingers, and ONCE SMELLED, the tang is seldom forgotten. In

this highly specialized age, we hear it frequently referred to as HALITOSIS in man.

After some years observing housing conditions on the farm, the writer has come to the conclusion that OVERCROWDING and NO VENTILATION are the leading causes of most outbreaks of roup—especially in the fall and winter.. We have SUMMER ROUP too—like summer colds in man. Of course the “out and out” cause of roup is germs. These germs are present a good deal of the time and when for some reason the PEP or vitality of the flock is lowered by overcrowding, lack of ventilation, improper feeding, chilling, or overheating, trouble begins. The birds then may show all or any of the symptoms mentioned in the previous paragraph. GET THIS STRAIGHT—chickens breathe germs with every breath just as man does. Some are harmless and others—

Roup May Have Many Causes.

NORMALLY HARMLESS when the birds are up and coming—can set up this roup disease when the VITALITY of the flock is lowered. I mention this because some folks think it is possible to DISINFECT the air of a chicken house during an outbreak of roup. We couldn't sterilize the air even though we wanted to. It is generally assumed that the type of roup we are discussing can be



Fig. 3. Young Bird Affected with Roup
The eye is glued shut and covered with a large scab.

caused by a VARIETY of germs and those causing trouble in one chicken house may not NECESSARILY be responsible for the disease in another. In winter some hen-houses frost badly on the inside. During the day when the sun shines brightly, the frost melts and soaks the litter. Pretty soon the house warms up, the litter steams and we have a MODIFIED turkish bath. As the evening ap-

proaches, the birds, now in almost a sweat, cool off and the "cold" begins.

**Avoiding Roup
Is Far Better
Than Any Cure.**

Most of us have heard the old adage that an ounce of prevention is worth a pound of cure. We believe it, too, but don't work very hard at it most of the time. Prevention really means something in roup. There are innumerable so-called roup cures—some you are advised to SQUIRT about in the air, some you put in the DRINKING WATER and still others you RUB on. Fumigating a henhouse ALREADY DAMP and moist as it is, is suicide for the flock. There isn't anything you can put in the drinking water that will relieve one of these GORGEOUS SWELLED HEADS and most certainly rubbing SALVE on a pus-filled eye is useless. Every year or so we have a brand new CROP of roup cures. Some of them are even imported from CHINA. You may not care for the treatment we have to offer, but at least it's RATIONAL. If you had a cold yourself with one eye filled with pus and swollen as big as a hens' egg, I'll guarantee you wouldn't expect a GARGLE to help the eye. Now then, you must first relieve the overcrowded condition in the house. Figure three square feet for leghorns and four square feet for the heavy breeds and you are not far off. Do this arithmetic problem and determine how many hens should be in the house. Destroy all birds whose heads are swollen badly. Have someone who KNOWS ventilation look over the poultry house and suggest ways and means to improve the intake and outlet of air. A STRAW LOFT with cross-ventilation above is hard to beat. When the air is moving properly and the house is free of draughts, noticeable improvement should be seen. Some birds with runny eyes may be helped by bathing the eyes frequently with a mild boric acid solution. Better still, secure from your drug store a few ounces of a 10 per cent solution of argyrol and a medicine dropper. Place a drop or two of this DIRECTLY on the eyeball and wiggle the lids over it. Repeat as often as necessary. If you attempt treatment of birds with eyes glued shut—first pry the lids apart, squeeze out the pus, and then apply the argyrol. Treatment of badly affected birds is very discouraging and takes a lot of time. It is not advised.

**Axe Is the Best
Treatment for
Badly Swelled
Heads.**

From time immemorial it has been customary to recommend putting various antiseptics in the drinking water.

It is hard to imagine how a bit of potassium permanganate dissolved in a pan of water will relieve a bird with a swollen eye. Most of the roup "cures" depend on this principle for their success—if any. We will offer none here because little good will come of it except to make the owner feel that he or she is doing SOMETHING. How much better it would be if the owner cleaned out the very sick birds, reduced the numbers in the house, improved ventilation, and disinfected sensibly by a careful cleaning of the drinking and feeding utensils. Even with this method, it takes time for recovery—it won't take place over night. Roup sometimes hangs on for several weeks in spite of the best of management. Vaccination is not always successful.

**Dope in the
Drinking Water
Not Advised.**

CANKER

Canker is usually described with chicken pox and said to be one and the same disease. Pox is that form in which nodules, blisters, and scabs appear on the unfeathered part of the fowl. It will not be discussed here, as it is seldom seen in Minnesota. The canker type is VERY frequently seen. Some call it DIPHTHERIA. It is an infectious or CATCHING disease and sometimes spreads very fast. The germ or VIRUS causing it is found in the affected parts of the bird. Canker shows itself by the formation of cheesy YELLOW PATCHES found in the corners of the jaws, roof of the mouth, and down the windpipe. It has the typical NASTY ODOR of roup. Some folks mistake these yellow patches for particles of yellow corn stuck to the mouth and frequently write describing it as such. If the owner is not a careful observer, he sometimes says the birds suffocate or drop dead. As a rule he has not made a careful examination of the mouth and throat. A large mass of this yellow dried pus might easily choke the bird if it was located in the windpipe. Sometimes canker and SWELLED HEAD or roup appear together. The owner notices the swollen heads, but fails to look for the yellow patches in the mouth and throat. The name DIPHTHERIA is used when the yellow patches or membranes form about the windpipe.

**Sore Mouth Is
Another Name
for Canker.**

The sick birds may WHEEZE, cough or stand around gasping for breath. If the sores are numerous about the mouth, the bird's appetite may be impaired because it probably hurts the birds to eat. It is quite easy to discover

**Treating Canker
Requires the
Patience of Job.**

the patches if the mouth is opened. For treatment, the same DRASTIC methods are advised as for roup. Destroy all birds with mouths and throats badly affected. They are unthrifty anyway and seldom recover satisfactorily. In run-down flocks the disease may spread rapidly. It is difficult to say how the disease spreads other than by direct contact from bird to bird or through infected food and water. Birds with small, easily reached patches may be treated, but you are warned that the treatment requires much time and patience. The yellow scabs must be scraped away with a knife blade and then painted with tincture of iodine. Better still, remove the patches and sear or burn the area underneath with a stick of LUNAR CAUSTIC. Be sure to wrap the stick with a piece of paper so as not to burn yourself. The affected spots may have to be treated several times. If the eye is involved, first open the lid and press out the "matter" and then place a few drops of a 10 per cent solution of argyrol directly on the eyeball.

Vaccination has been advocated a great deal and many reports claim wonderful results. This may be so, but a great deal depends upon the KIND OF VACCINE used. The so-called mixed infection bacterins have never given good results in our hands. It is suggested that when vaccination is practiced get vaccine from a reliable source. Be sure it is a vaccine and not a bacterin. Most users find the vaccine more valuable as a preventive of canker. Of course, you will make use of all the regular sanitary measures as well. Clean up the henhouse—remove the badly affected birds, and if the flock is overcrowded, reduce the numbers. It is believed that the removal of sick birds will stop the disease most quickly. This would apply to the average farm flock.

INFECTIOUS BRONCHITIS

**This Is Called a
"New" Disease.**

The name, infectious bronchitis, is used because it is a lot easier to pronounce than its other name—LARYNGO-TRACHEITIS. Boiled down this means an inflammation of the upper air passages. Bronchitis may affect birds from one week to 18 months of age. Birds older than that are relatively immune. This disease has come to the front in the last few years. It very likely existed before, but was unrecognized or the losses were not severe enough to cause great concern. Possibly mass production, better brooding, and concentration of large numbers of birds in

close quarters may play a part. The disease may attack home-hatched chicks as well as those produced in hatcheries, the exact cause being undetermined. It is very contagious. All species of fowls are affected. In recent years feeding plants where large numbers of birds are handled in batteries have suffered extremely heavy losses. Other names given this disease are influenza, "flu," and gapes. It is seen most often in the fall and winter and is observed from babyhood up.

Bronchitis may be either acute and quick acting or it may be chronic and long drawn out. In the acute type the losses may run 50 per cent or more. In older birds the disease sometimes runs the RAPID course so often seen in chicks or it may drag on for weeks. In chicks the disease may kill off a lot of birds at first and then leave the remaining ones in such a weakened condition as to render them unthrifty, many becoming runts. Baby chicks become droopy. They look and act sick. The feathers are bedraggled and every few seconds they stretch their necks out and upward in a quick gasp for air. This attitude is so common that many people speak of them as GASPERS. Some owners may think this is caused by the gape worm. Examination will show the contrary. As evening approaches the gasping is likely to be more pronounced and the losses from suffocation are increased. A few may sneeze and rattle as they try to get air. Some observers seem to think the chicks emit a characteristic "cheep" or wailing cry. The older birds may not show such exaggerated symptoms, but the typical PUMP-HANDLE difficult breathing is seen together with loss of appetite, unthrifty appearance, and slack egg production. In large concentration plants where birds are fattened the course of bronchitis may be VERY RAPID, killing literally HUNDREDS in a few hours and then dwindle into the chronic form as time goes on. In spring the average farm outbreak among chicks may cause the loss of any number from a dozen or so to the entire brooder-house flock. Spontaneous recovery may or may not take place.

Examination of the sick birds will show the disease confined almost exclusively to the upper part of the windpipe and larynx. Here we find masses of BLOOD STAINED mucus, reddened lining walls, and even patches of ulcerated tissue. The precise cause of death is this

**We Will Call
It "Bronchitis"
for Short.**

**Pump-Handle
Breathing
Points to
Bronchitis.**

**Drug Treatment
Is Not Very
Encouraging.**

mucus or PHLEGM, which actually closes the air passages and chokes the birds to death. Treatment has been very unsuccessful. Drugs in pill form, fumigations, or sprays have not helped. They may even aggravate the trouble. The sick birds should be removed immediately and kept away from the rest. Overcrowding **MUST** be avoided. Buildings should be dry and **WELL VENTILATED**. Feed any good ration. Dosing the birds with epsom salts or other drugs will increase the losses. Don't buy patent medicines from peddlers and be careful not to carry the disease from one brooder house to another. Keep the drinking and feeding dishes spotlessly clean and sanitary. Try to build up the resistance of the flock by careful management. This outline of treatment is admittedly unsatisfactory and you may be tempted to resort to the guaranteed "cure-alls" for relief. However, it is all that can be recommended at present.

CHOLERA

**Cholera Kills
Birds Fast.**

Fowl cholera is the most fatal of all poultry diseases. It is not related in any way to hog cholera. Cholera may attack geese, ducks, chickens, or turkeys. Outbreaks may occur at any time and are often observed in flocks that are apparently in tip top condition. This is especially true of geese and ducks being fattened for market. The birds die in great numbers and more often than not the disease starts without any warning other than finding several birds dead under the roosts in the morning. Many people blame the loss to poisoning of some sort. As a general rule, cholera appears in the form of a storm—it may appear suddenly, run its course, and gradually disappear, leaving behind numerous dead birds. In the acute, or rapid, type many birds die and the disease passes on. In the chronic, or slow-acting, type the course of the outbreak is delayed, the deaths are not so sudden, but the disease hangs on much longer, sometimes lasting several weeks. Cholera is caused by a germ that is widely distributed in nature and may often be found in the air passages of perfectly healthy birds. It appears that at times when, for some reason, the resistance of the flock is reduced, these germs, being present, suddenly become active and attack the birds. Various causes may reduce the vitality of a flock. The birds may be too fat, overcrowded, starved, or subjected to exposure. In this weakened con-

dition the birds fall easy prey to the ravages of this germ, which is more or less harmless when the birds are in good trim.

The symptoms of cholera are often very puzzling, even to the expert. This makes the disease difficult to recognize. Many poultrymen report finding a few dead hens under the roosts. The flock may have appeared perfectly healthy the evening before. This is the acute kind. Chronic cholera requires more time to develop and some birds may be sick for several days. They appear in SLEEPY hunched-up attitudes and may exhibit a foul-smelling diarrhea. Examination after death does not always furnish CONCLUSIVE evidence. First, peel the skin back from the breast. You may notice the "white meat" to be HIGHLY COLORED, sometimes even a light reddish shade. Upon opening the carcass, the liver may be greatly enlarged and engorged with blood, causing it to break or crumble easily. The surface of the HEART may show pin-point hemorrhages while the intestines appear inflamed or congested with the BLOOD VESSELS standing out prominently. With this brief description, we might sum up by saying that a diagnosis of cholera may be GUESSED when birds die suddenly without seeming cause together with reddened breast muscles, enlarged liver, and inflamed heart and intestines. This is a pure guess, however, and a laboratory test is necessary to clinch the diagnosis.

There are NO MEDICINES of any value for the treatment of cholera. Many are sold, but they have not justified themselves. Vaccination is often advocated altho the writer does not recommend it. Fowl cholera is one of the most unsatisfactory diseases to combat. As a rule, all one can do is to employ common sense sanitation. Destroy the sick birds and, if possible, seek new quarters. It is best to reduce the quantity of feed and correct anything in the way of overcrowding and poor ventilation. Fortunately, cholera is not common and an outbreak is often over before the owner gets organized to fight it.

BACILLARY WHITE DIARRHEA

First, try to understand just what this disease is. Some call it bacillary white diarrhea while others speak of it as B.W.D. which is nothing more than an abbreviation of the first name. Poultry raisers are apt to think all birds

**Symptoms
Uncertain. And
Control Is
Troublesome.**

White Diarrhea
—B.W.D.—
Pullorum.
Take Your Pick.

with LOOSE BOWELS are affected with this disease. Nothing could be farther from the truth. As a matter of fact, it is probably true that much of the so-called "white diarrhea" is not the infectious type, but rather a bowel disturbance set up by any one of several kinds of mismanagement. To avoid confusion, there is a movement to change its name to PULLORUM disease after the name of the germ causing it. Hatchery men have so popularized the term B.W.D. that it will be hard to make the change. Just remember all these names refer to the same disease. The word "diarrhea" is much overworked—it is but a symptom and only means the bowels move TOO FREELY. Let's understand this CLEARLY—because chicks have a diarrhea and are more or less PASTED UP BEHIND does not mean they are affected with this disease, whatever name you choose to call it. Many chicks die of pullorum disease without having any diarrhea whatever. Such a condition may be brought on by DIRTY surroundings, overcrowding, or faulty feeding. Many chick growers do not seem to realize that baby chicks are INFANTS and must be handled with extreme care as to cleanliness. Pullorum disease affects the digestive tract of chicks and droppings from a sick bird contain countless germs. Baby chicks recovering from the disease are frequent carriers. The pullorum germs stay in their egg-laying organs and when the birds are big enough to lay, many produce eggs with live germs in them. When such an egg hatches, the chick is already infected and may infect other birds through its GERM-LADEN DROPPINGS which quickly soil the feed and water dishes.

Some Birds
Don't Have Any
Diarrhea.

The actions of chicks affected with pullorum disease mean nothing. All sick chicks look pretty much alike. Many traveling "experts" claim to be able to recognize the disease by the COLOR OF THE DROPPINGS. This is sheer buncombe. Birds usually begin to die within 72 hours after they leave the shell. If all goes well for 10 or more days, the danger period is largely past and when the birds reach three or four weeks of age, they are relatively safe. Many chicks may be loose while others may show NO DIARRHEA. The death rate runs from 30 to 90 per cent. An important thing to remember is— if you are losing a large number of chicks under two weeks of age, there is a CHANCE of bacillary white

diarrhea. No one can positively identify the disease by hand examination of a dead bird. A few of the sick or dead chicks should be sent to the Veterinary division, University Farm, for further investigation. The service is free.

Unfortunately, there is no drug treatment for pullorum disease. Every effort should be made to prevent its spread. ALL VISIBLY SICK birds should be destroyed. It's small loss, for should a few recover, they may develop into carriers and start the disease again next spring. Scald all drinking and feeding utensils daily. Clean the brooder house carefully, disinfect, and change litter frequently. Nearly everyone likes to put SOMETHING in the drinking water. Potassium permanganate is the old standby for this purpose. Add enough of this to turn the water a deep purple. Put it out fresh twice daily. It is very doubtful whether this does much good, but at least it keeps the owner busy. Since the disease spreads through the droppings, removal of the sick birds and CONSTANT cleanliness should be the watchword. Prevention of pullorum disease is far more effective than cure. It is now possible to give a laying flock a blood test. If the test is interpreted properly and the reacting hens are removed, little, if any, trouble should be experienced when using hatching eggs from such a flock. The test, honestly carried out, is quite accurate and is being widely used. If you are in the habit of buying baby chicks, good judgment would point to the selection of a hatchery ACTUALLY putting out chicks from B.W.D. or pullorum tested flocks. CAUTION—even though you buy fully accredited chicks from an accredited hatchery, that does not mean they will not develop a bowel disturbance if they are not well cared for.

BLACKHEAD

Blackhead is a very common and destructive disease of turkeys. It may affect chickens when they are raised in close contact with a flock of diseased turkeys. The name blackhead means little or nothing and is misleading besides. The heads of the affected birds do not turn black. Scientists call it by its right name—ENTERO-HEPATITIS, which means "entero" for intestines and "hepatitis" for the liver. It is, therefore, a disease of the liver and intestines of turkeys and is in no way associated with

Testing Will
Help Eradicate
B.W.D.

Name Is Con-
fusing—Heads
Do Not Get
Black.

**You Can
Easily Dodge
Blackhead.**

the head. For some years it has been known that chickens may act as transmitters of blackhead, but only recently were attempts made to control it—since there is NO CURE. Investigations show clearly that if turkeys are raised away from the farmyard and without any contact with chickens, blackhead can largely be avoided. The only way this can be accomplished is to grow the birds by artificial methods, using brooder houses to start them and then graduate them to enclosures at a considerable distance from the buildings. In other words, by yarding one is able to absolutely control the flock and keep them away from infection they would otherwise be sure to pick up. Minnesota took the lead in advocating growing

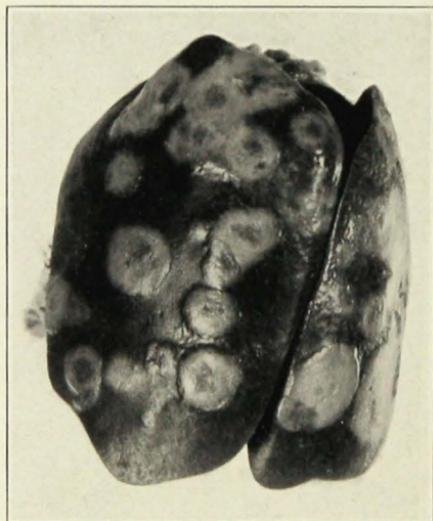


Fig. 4. Black head Liver, Showing Greenish Yellow Ulcers on Surface

turkeys in confinement on the FARM. The plan is HIGHLY successful and is now practiced by ALL successful turkey growers. Of course, growing turkeys in yards means more work for the caretaker, but the losses are reduced to a minimum and the birds grow fast-

er and bigger with fewer No. 2's. If you are willing to throw away all your former ideas concerning turkeys and try something new—NOT UNTRIED, mind you—we will be glad to send you a copy of "Talking Turkey." Your request on a post-card will bring it to you. All you need to know to follow this plan is contained in this FREE bulletin. Your copy is waiting for you.

**Ask for
Bulletin 124**

COCCIDIOSIS

After chicks have successfully weathered the first three or four weeks of their life, the next obstacle to a ripe old age is COCCIDIOSIS, a disease with a long name and a very high death rate. It is NOT CAUSED BY UN-

SANITARY surroundings, altho such conditions will reduce vitality and birds fall prey easier. The cause is a TINY parasite which lives in the SOIL about the farm buildings. In large, commercial flocks, where the same ground is used over and over, it is practically impossible to avoid the disease. In the older poultry raising states coccidiosis is VERY common. Birds from three or four weeks old up to about eight weeks are MOST susceptible. The germ enters the bird with contaminated food and water and is carried into the INTESTINES and the two-pouched blind gut, where it thrives and multiplies. This soon causes a severe inflammation which may produce a bloody diarrhea. Old birds are not often sick to death, but may act as CARRIERS and transmit the germs to younger and more delicate birds from three to eight weeks old. The droppings of sick chicks are especially dangerous, as they carry millions of germs which pollute the feed and water, thus endangering other healthy birds. The AGE of the affected birds is IMPORTANT. There may or many not be BLOODY droppings. Some birds drink a lot and appear in drowsy attitudes. Death may follow in a few hours after the disease develops; some birds may be sick several days. A few may recover and act as carriers for other generations of chicks to come.

**Watch Birds
Three Weeks
Old.**

Many of the birds have a FROWSY APPEARANCE, with unkempt feathers and dragging wings. When birds of the above age die in fairly large numbers, some showing evidence of blood-stained droppings, there is an EVEN CHANCE of its being coccidiosis. When



Fig. 5. Birds Suffering from Coccidiosis

The trouble starts at about this age and continues to six or eight weeks of age.

**A Pinch of
Prevention
Worth Pounds
of Cures.**

examining a dead bird, be sure to observe the intestines carefully. They may be found very much reddened and the CAECUM, or blind gut, is likely to be enlarged or swollen and filled with bloody material. White specks of pin-head size are frequently noted on the intestines. These are tiny ulcers. These few symptoms, together with the age, are helpful in making a reasonable guess that the trouble is coccidiosis. However, a POSITIVE diagnosis can be made ONLY in a laboratory such as is maintained at University Farm. The treatment of coccidiosis is not satisfactory. Innumerable drugs have been advocated but the FACTS say they are not effective. As in most chicken diseases, the best way to handle an outbreak is to endeavor to prevent FURTHER losses—not worry about curing the sick ones. It can't be done, anyway. You should not lose sight of the fact that the germs pass out through the droppings—therefore, the floor of the brooder house should be cleaned DAILY. It requires a few days for the NEWLY PASSED germs to develop to the HARMFUL stage, so if the owner cleans and RECLEANS persistently, much good will be accomplished. Scald the drinking and feeding dishes every day. The sick birds may just as well be DECAPITATED first as last, for they will die anyway. It has been suggested to use a mash composed of 40 PER CENT dried milk as a means of control and treatment. The best that can be said for this is—it is a very nutritious and easily digested mash and should reduce the strain on the bird's digestive organs. To say that it will cure birds and stop an outbreak is rather far-fetched. Such a mash, together with GOOD sanitation and destruction of the sick birds, should be helpful. Antiseptics in the drinking water will not stop the disease. THIS WILL HELP as much as anything—first, kill the sick birds and, if possible, move the rest of the flock to another brooder house. If this can not be done, remove the birds, scald the floor, and resurface with clean sand for litter. Replace with fresh sand DAILY. Haul the brooder house to a new and CLEAN patch of ground at some distance from the farm-house. If you would like to dodge coccidiosis NEXT year, send for Poultry Sanitation, Leaflet No. 21. It is FREE.

WORMS

This section will deal with the three common intestinal worms of poultry. In discussing them, certain drugs will be recommended for their removal. The reader should know that many times the flock is ruined before worms are EVEN SUSPECTED and the best of treatments, while they may expel the worms from the remaining birds in the flock, will not restore to health the COUNTLESS RUNTS. It is far better to PREVENT your young flock from becoming wormy than to allow the birds to become infested and then seek a cure. It is SO EASY to prevent worms, one wonders why more people do not make the ATTEMPT. In the OLD DAYS farmers did not have a great deal of trouble with worms. The soil was new. It was CLEAN and chickens had not been raised long. In recent years, worm trouble has become much more prevalent because of the CONTINUOUS use of the SAME SOIL year after year. So much so that some folks have come to believe that worms are PART of the chicken business. This is FAR from the truth. Worms are a nuisance and, while it may be impossible to ERADICATE THEM ENTIRELY, they can be controlled to such a degree as to cause the owner little or no concern. For many years growers have been putting their faith in worm expellers, but experience has shown this will not CONTROL worms. They will NOT prevent birds from becoming infested, but will expel the worms later on, AFTER the bird has become STUNTED and often worthless WITH or WITHOUT the worms. Scientific investigations have shown that worms in practically all forms of livestock attack the YOUNG chiefly. This is true of chickens. It has been demonstrated that if growing chicks are raised on CLEAN ground a couple of HUNDRED yards from the farm buildings and kept there entirely APART from the older WORM-CARRYING HENS until they are SIXTEEN WEEKS old, it is next to impossible to have them become wormy enough to injure their health after that time. Chicks are in reality INFANTS. When small they are not able to fight off the worms, but when they get out of the SHORT-PANTS STAGE, they ACQUIRE STRENGTH enough to battle worms if they should meet up with them later on. Now, leave it to your own sober

**Prevent Worms.
You Can Do It.**

**Worm Prevention
Furnishes Free
Reducing
Exercise.**

**Leaflet No. 21
To the Rescue
Again.**

judgment—KNOWING these facts, why not give the birds a chance? Of course it means more work. It requires a brooder house. The caretaker will have to do a bit of walking out to the brooder house, too. The RESULTS, however, more than repay the work involved. If you are interested, send for Leaflet No. 21, on Poultry Sanitation. All the steps are given briefly and to the point—feeding directions, also.

Round Worms

In this section we are referring to the COMMON round worm so often seen in chickens and less frequently in ducks, geese, and turkeys. It is widely distributed throughout Minnesota. The worms are white, sharp pointed on both ends, and vary from one to five inches in length. They may be found in birds of all ages, but appear to do most damage in young birds by stunting their growth and otherwise ruining their chances of ever being productive. Large numbers of the worms sometimes block the passage of food through the intestines. Birds may be infested as early as two weeks of age, but if kept free for 12 to 16 weeks, they are not usually seriously affected after that time. The worm eggs pass out with the droppings and if weather conditions are favorable, hatch and become dangerous in from two to three weeks. The young worm is then swallowed by a healthy bird and passes into the intestines, where it completes its development, growing to its full size in about two months. Worm eggs withstand much cold, but little heat. In unshaded soil, hot summer sun doubtless destroys many eggs. In dark places such as a grove or windbreak, eggs will remain alive for a long time. In this connection, it is well to remember to keep young birds away from such places.

**Round Worms
Are Most
Common.**

Birds affected with worms are UNTHRIFTY. Some claim to be able to recognize wormy birds by merely LOOKING at them. Don't depend on this. When chicks or older birds fail to grow NORMALLY, become weak and often paralyzed, one should open a few and with a pair of sharp-pointed scissors go through the INTESTINES carefully. The worms are big enough to be seen easily. You do not need to use your imagination. When worms in SUFFICIENT NUMBERS to cause trouble are discovered, the next step is to remove them as quickly as possible. This is accomplished in several

ways. Perhaps the best treatment is to dose EACH bird with nicotine sulphate capsules. These are sold under various trade names. Your druggist can supply them. This treatment is not so popular as it should be because each bird must be handled individually. It is, however, very effective. Always follow the directions found on the package. The tobacco dust treatment has been used for years. It seems designed for folks who want a WORK-LESS WORMER. The University of California recommends that 2 per cent by WEIGHT of tobacco dust containing at least 1.5 per cent nicotine be added to any good mash. This mixture is fed for about a month and repeated a few weeks later if found necessary. The writer prefers the individual treatment to the mash or flock method. Recently various so-called DOUBLE TREATMENTS designed to remove both round worms and tapeworms with one pill have appeared on the market. These have not been successful with us. As a rule, a flock is harboring in LARGE NUMBERS one worm or the other. If two treatments are found to be advisable, the tapeworms may be removed with KAMALA a few days afterward. Do not treat a LAYING FLOCK for worms unless you are SURE they are heavily infested with worms. Great reduction in eggs usually follows. Prevention is the order of the day. During August and September of each year, hundreds of flocks are found to be worthless as layers the following winter. They are undersized weaklings and likely, even after worming and the best of care from then on, won't lay an egg until the next Fourth of July. Dodging worms beats PILLING them any day. Our Leaflet No. 21 will help you. Send for it NOW.

How to Rid the Flock of Worms.

Tapeworms

Tapeworms are flat, white, linked or segmented worms varying in length from less than an inch to nearly a foot. Some are very hard to see with the naked eye; others are readily recognized. Tapeworms do all their growing from the head end and as the segments or joints are added just back of the neck, the older ones are gradually pushed along and sloughed off near the "tail." Therefore, to completely rid a bird of tapeworms, the HEADS MUST BE DISLODGED where they are attached to the wall of the intestines. There are several varieties of tapeworms. The life history of all of them is not known, but some of

Tapeworms Are
Becoming More
Common.

**Bugs Eat the
Eggs and
Chickens Eat
the Bugs.**

them do pass through such intermediate hosts as house flies, beetles, snails, slugs, and earthworms before they are taken up by chickens. One might refer to these insects as TAPEWORM INCUBATORS. The insect eats the eggs—hatches them—and the chicken in turn eats the insect and gets the tapeworm along with it for good measure. When present in large numbers, tapeworms may be found in the lower part of the intestines matted together like so much snarled white thread. Birds carrying many tapeworms are unthrifty. There is loss of appetite, and a chronic diarrhea often stains the feathers about the vent. The physical appearance of the birds is no different from those having round worms. Lameness or total paralysis may be seen. Examination of a few sick birds should lead to the discovery of tapeworms. One or two worms probably do little damage, but LARGE NUMBERS cause considerable losses. Some farmers report seeing "small white maggots" in FRESH droppings. These are NOT maggots, but segments of tapeworms broken off from the MOTHER tapeworm and passed out with the droppings. It is these very segments or the eggs they contain which pass THEIR next stage in the insects mentioned above.

**Watch the
Dose of Kamala
Very Carefully.**

The best drug for the removal of tapeworms is KAMALA. The dose is a one-gram capsule or compressed tablet to a FULL GROWN chicken. When a badly infested and consequently WEAKENED flock is to be treated, it is safest to make a test dose with six hens. The first two birds should get the full one-gram dose, the second pair should receive half a pill each, and the last two one-fourth a pill each. Always use the SICKEST birds for the test. If the largest dose has no ill effects on the test birds, it should be safe for the rest of the flock. DO NOT ADMINISTER KAMALA to young birds, and avoid treating a flock run down from roup, coccidiosis, or any other disease that might have greatly lowered their vitality. Since it is well known that birds under three months of age often carry enormous numbers of tapeworms and since it is ADMITTEDLY dangerous to treat birds of that age, what will the owner do when a flock of young pullets is affected? The answer is to make the test dose as described and take chances. Birds so weak as to be unable to stand the treatment would die anyway.

Make the best of a bad bargain and resolve not to have the same trouble NEXT year. Clean up the brooder house and scald the floor with BOILING water. Move it at least TWO hundred yards from the farmhouse. Keep the young growing birds entirely apart from the old flock on this clean ground until they are about 16 weeks old and tapeworms will be noticeable by their ABSENCE. Leaflet No. 21 will help you. It's free.

Caecal Worms

These worms are often called poultry pin worms. They are threadlike white worms and are seldom more than half an inch long. They inhabit the caecum, or what many term the "blind gut," an appendix-like two-pouched sac near the end of the intestines. Most birds harbor a few of these little worms and unless they are found in great numbers, it is likely they do scant harm. At least, few heavy losses have been DEFINITELY traced to them. Pin worms are, however, involved in the transmission of blackhead in turkeys. The sanitation plan devised for the control of round worms and tapeworms will prevent heavy infestations of caecal worms. Until our knowledge of the ill effects of this worm is greater than it is now, poultrymen need not be greatly concerned over finding a few.

Various methods for their removal have been advocated. The continuous feeding of 2 per cent tobacco dust in the mash is one way. Probably the most satisfactory treatment is the use of oil of chenopodium. This is mixed with cottonseed oil at the rate of one teaspoonful of oil of chenopodium to 6 ounces of cottonseed oil. Each ADULT bird receives one-third of an ounce of this mixture. This is NOT TO BE GIVEN BY MOUTH. A special hard rubber enema syringe is used. The nozzle is pushed a few inches into the rectum and the dose of oil injected there. Few farmers will have occasion to treat their flocks for these worms, as the damage done by them is not definitely known. When some unusual disturbance occurs in a flock, many of the traveling salesmen experts open a bird or two and, as it is easy to find a few pin worms, point to these as the cause of the trouble. Such a diagnosis is always questionable unless the worms are present in ENORMOUS numbers.

Pin Worms
Are Very
Common.

LEG WEAKNESS

**All About the
Bugbear Leg
Weakness.**

Leg weakness is just another **OVERWORKED** name for a symptom—**NOT** a disease. It comes in about the same class as bowel trouble. It is not a specific disease, but merely a symptom which certain birds may show when suffering from any one of a half dozen **DIFFERENT** diseases. Birds affected with white diarrhea, coccidiosis, worms, cholera, tuberculosis, etc., etc., may and **DO** frequently become weak in the legs and even lame or paralyzed. Just because a bird, loaded down with tapeworms, develops a weak and **WOBBLY** gait and staggers blindly about the farmyard, is **NO REASON** for calling the trouble "leg weakness"—it's tapeworms and this won't be discovered until this bird is examined **INTERNALLY**. Lack of minerals has been put forward as a cause of leg weakness in mature fowls. It is difficult to see how this can occur when the farm flock is running outside and has access to sensible feeds together with an abundance of oyster shells and greens. Five per cent bonemeal added to any mash will correct this lack. There is **NO NEED** for feeding any of the complicated mineral mixtures. Neither is there conclusive evidence that chicks or laying hens **MUST HAVE** dried ocean **SEAWEED**. Normal, sensible, balanced rations, together with clean range, should be sufficient for most farm flocks.

**Cod Liver Oil—
the Baby Chick
Saver.**

In baby chicks, leg weakness means something. Nowadays when millions of chicks are raised **ARTIFICIALLY** in brooder houses, it is possible for this weakness to occur because of close confinement, lack of direct **SUNSHINE** and green feed. When chicks are not subjected to these three disadvantages, leg weakness seldom appears. When chicks are deprived of these things, leg weakness can be easily prevented by adding about one quart of **COD LIVER OIL** to each 100 pounds of the mash fed. After the chicks are outdoors and exercising freely, the oil may be omitted.

LICE

A farmer once said that folks who raise chickens must put up with **LICE**. This is the attitude of a great many people—in fact, some look upon them as a **NECESSARY** evil. Perhaps they are thinking of what David Harum said about dog fleas: "a reasonable amount of fleas is good for a dog for it keeps him from brooding over

being a dog." Lice cause a much greater annoyance to chickens than is generally supposed. Even small chicks suffer a great deal. The constant irritation from biting and feeding on the skin makes the bird's life miserable and its growth is impaired. There is absolutely NO REASON why a flock of hens can not be freed from these pests and KEPT free. Lice cause discomfort by the continual gnawing and chewing at the skin of the birds. They usually work during the day. A reasonably careful examination of infested birds quickly brings them to light for they can be seen with the unaided eye. The area about the vent is a favorite place for them to congregate. There have been innumerable SILLY methods offered to a gullible public for the eradication of lice. These have proved worthless, much to the satisfaction of the lice population which THRIVED thereby. One of the best and by far the cheapest way to rid a flock of lice is to use SODIUM FLUORIDE. This is a white powder costing about 50 cents a pound. This amount is sufficient for 100 birds. The powder may irritate if the operator breathes much of it, but is otherwise harmless unless actually eaten. The pinch method is generally the best means of administration—this means the bird is held on a box or barrel and several pinches rubbed ON THE SKIN in as many places on the bird's body—as about the vent, under each wing, on the breast, back, and thighs. If applied properly, one application is enough to kill ALL THE LICE and also their EGGS. This treatment, if applied in the fall before the birds are shut in for the winter, should keep them clean all season. Twice a year is a fine prevention program. In warm, summer weather, the flock may be DIPPED in a solution in which sodium fluoride has been dissolved at the rate of one ounce of the powder to a gallon of water. The bird is dipped, the feathers ruffled to permit penetration, and the head then ducked for an INSTANT. DO NOT hold them under too long. Dipping should be done only in the middle of a nice, warm, summer day.

**Lice Are a
Luxury. They
Are Easy to
Get Rid Of, Too.**

Forty per cent nicotine sulphate solutions have been widely used of late. One paints the roosts with the black liquid a short time before the birds go to roost. The vapors rise up through the feathers of the roosting fowls and kill MANY of the lice. It is usually necessary to repeat the treatment at frequent intervals because ALL

the lice and their eggs are not destroyed. This method is popular because the owner does not need to work hard. It is NOT as effective as the sodium fluoride method.

MITES

**Mites Are
Poultry
Bedbugs and
Unpleasant
Bed Fellows.**

Mites are fully as obnoxious as lice. There are many kinds of mites. The one described here is the COMMON RED MITE. In its habits, it closely resembles the BEDBUG. It works only at night and leaves the body of the bird during daylight hours to hide in cracks and crevices of the henhouse. It is gray, but when it sucks blood from the hen it becomes red. When filled with blood the mite retires from the hen, lays a batch of eggs and goes back to the bird for another meal. All it does is eat and lay eggs. If the roosts are carefully examined, one usually finds the characteristic SALT and

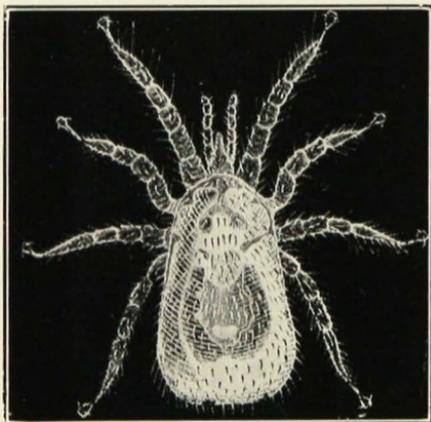


Fig. 6. Wicked Looking Animal, the Chicken Mite, or Poultry Bedbug
They work while the hen tries to sleep. Don't feed mites.

PEPPER marks. These are comparable to fly "specks." In large numbers, mites will ruin egg production in a heavily laying flock. Sometimes setting hens are killed on the nests. Mites are hardy, too. They often live in EMPTY henhouses for months without starving. There are many ways to rid a building of mites.

Perhaps the best thing to use is an OILY spray such as anthracene oil or carbolineum. The house should be cleaned FIRST. Then spray the roosts, supports, dropping boards, nests, and all other likely places where the mites may be hiding. To make sure of killing ALL of them, spray the entire inner surface of the building. The flock should be kept from the house until the fumes have disappeared and the oil has soaked into the wood. Common dips, carbolic acid, or even kerosene are not nearly so effective. They are too light in BODY and evaporate too quickly. If the oils mentioned can not be obtained from your drug

store or lumber yard, waste crank case oil from a car or tractor NOT burning ethyl gasoline makes a fair substitute. Apply this in the same way. One treatment each fall should keep the house FREE of mites.

SCALY LEG

The name SCALY LEG describes this disease to a "T." It is caused by one of the itch mites belonging to the same general family that produces mange in other farm animals. The mites first attach themselves to the feet of the birds and dig under the scales between the toes. They BURROW to form tunnels under the scales until the scaly portion of the feet and legs is affected. Soon the scales begin to BUCKLE OUTWARD to make room for the rapidly increasing mite population underneath. Before long the leg becomes roughened and encrusted with grayish white material pushed out from under the scales by the MINING OPERATIONS below. The disease spreads slowly, being so gradual as not to be noted until many birds are affected. Treatment is simple. If only one or two birds are diseased it might be wise to use them on the table, as they are fit for food. Dipping the feet and legs in CRUDE PETROLEUM has given the best results. Pour the oil into a bucket and immerse the legs of the birds up to the top of the scaly part of the legs. Avoid having the oil touch the feathers and upper portions of the legs. Soak until the oil penetrates thoroly. One treatment is usually sufficient. Kerosene works fairly well, but is not so good as crude oil. If the infection is very bad, the henhouse should be cleaned and sprayed as described for red mites.

Scaly Leg Is
Chicken Mange.

FLESH MITES

These are white or yellowish-white CUCUMBER seed-like bodies found under the skin of most farm poultry. They are the remains of connective tissue mites. They rarely cause the death of a bird and most farm folks are not aware of their presence until they happen to see them when preparing a bird for table use. Then, they are often mistaken for TUBERCULOSIS, but of course have no relation to this disease. Ordinarily this mite lives on the outside of the bird, but dies under the skin and is then covered with a white deposit which acts as a preservative. This mite should not be mistaken for

White Seeds
Under the Skin.

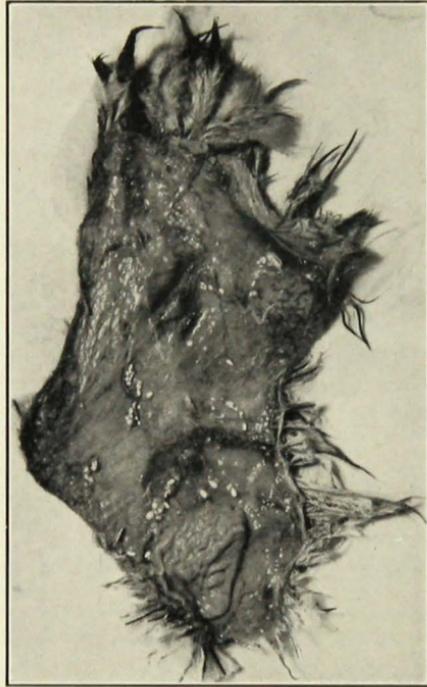


Fig. 7. White Seed-like Bodies Under the Skin
This is not tuberculosis. It is the remains of the connective tissue mite. They are usually considered harmless.

the usual cooking methods, they dissolve in the juices and pass unnoticed.

PROLAPSE OF THE OVIDUCT

Heavy Laying, Constipation Cause Prolapse.

Many poultrymen call this condition a "BLOW-OUT," which is not strictly true. It is very often observed in heavy-laying pullets, but may be brought on by chronic CONSTIPATION. It is readily recognized by the sight of the raw bleeding mass where the vent ought to be. Excessive straining causes the cloaca, or rectum, to turn wrong side out. Decide immediately what steps to take. Either destroy the bird at once or remove it from the rest of the flock for treatment. If the bird is permitted to run with the flock, the other birds will pick at the bloody mass and an epidemic of CANNIBALISM may develop. If the prolapse affects several birds in a heavy laying flock, the feed may be reduced, but egg production will decrease. It may be better to take the losses rather than to reduce the amount of feed.

the common red mite that infests many poultry houses. The white seed-like bodies are frequently seen through the skin of black-feathered birds. There is no record of their causing death losses. They are not considered harmful for home consumption, altho if seen before cooking, it is doubtful if the bird would be relished. When the bird is subjected to

If treatment is attempted, the protruding portion should be carefully washed with warm water, greased with olive or sweet oil and then GENTLY replaced by pushing the mass backward. If chronic constipation is the cause of the trouble, a teaspoonful of castor oil may prevent further prolapse. Feed lightly afterward.



Fig. 8. Prolapse of the Oviduct Through the Vent

This is quite common in large, heavy layers.

GAPES

Gapes is a parasitic disease of young chicks. The flocks of Minnesota have the good fortune to be comparatively free from it. The writer has never seen a case of it in the state. Nevertheless it is reported many times each spring because of the prevalent impression that whenever a chick YAWNS it must be gapes. When infectious bronchitis was general a few years ago, this was frequently reported as gapes. The disease is caused by small worms which attach themselves to the inside of the WINDPIPE. Here they cause irritation, and if numerous, interfere with breathing and may cause death. To make SURE of the presence of gape worms it is necessary to open the windpipe and look for the little worms on the inside. The worms are reddish in color and about an inch long. The worms, together with their eggs, are coughed up and thus water and soil become infested. Other healthy birds may then eat them with their food or water. The eggs and tiny embryos are swallowed, hatch in the gullet, and then find their way to the inside of the windpipe. The treatment usually practiced consists in snaring them from the air passages with a looped horse hair. Many fumigating agents have been tried with indifferent success. Chicks should be

**Gapes Not
Serious in
Minnesota.**

kept away from infected yards for at least one season. Older birds may carry the worms, but only the young chicks die when infected.

CROP BOUND

Occasionally a bird will overload the crop with dry grasses or a mixture of grass and grain. This may cause stagnation of the contents while the bird appears noticeably distended in the region of the crop. If allowed to remain, the mass becomes foul smelling and will cause an inflammation of the crop and the neighboring skin may turn green. The whole area will at times become a diseased mass which sometimes results in death. If taken early the crop may be massaged and, if water is introduced, loosened so that the contents will pass through naturally. If this is not a success, take a pair of scissors and, after removing a few of the feathers, cut through the skin and on into the crop itself. Remove the contents with a spoon—wash the crop thoroly and sew it together again. The operation is quite simple and if done soon after the mass forms, should be a success. Feed lightly for the next few days.

**Too Much Dry
Grasses Are
Cause of
Trouble.**

CONSTIPATION

Constipation is not a serious trouble but is seen often enough to warrant mention. It is probably caused by lack of exercise in too small quarters and a ration containing little or no succulent feeds. To remedy this, one may administer epsom salts or castor oil. If treatment is applied to an entire flock the epsom salts will be found best. The dose is one pound for each 100 birds. Dissolve the salts in water and give it before the morning feeding. For dosing one bird, castor oil will be best. Use about one teaspoonful per bird.

FEATHER EATING, EGG EATING, TOE PICKING, AND CANNIBALISM

Most of these habits are acquired and if an individual bird becomes a chronic offender the best cure is the hatchet. When the first feather eater is discovered it should be destroyed before the other birds learn the trick. Close confinement, lack of exercise, and too little variety of food may be causes.

Comb picking is another vicious habit. It may start from an accidental injury to the comb of one bird. The

blood flows from the wound and other birds are attracted. After tasting blood, they seem to crave more. Other birds notice this and very soon the bleeding bird becomes the center of ATTRACTION. Unless the injured bird is removed, the entire comb may be picked off. The time to act is when the trouble starts.

Toe picking may begin from an injury, also. Too close confinement is another cause. Overcrowding seems to encourage the habit. Many persons still persist in keeping 500 or 600 birds in a 10 by 12 brooder house. Withholding feed from chicks too long is another reason for this disgusting habit. Birds should have their mash from the start. Do not allow dead chicks to remain on the floor. It is suggested that bright red buttons be suspended on strings to about the level of the chicks so as to attract their attention and interest. Toe picking does not often occur when the ration is balanced properly and the house is not overcrowded. Watch for and remove injured birds. Give plenty of green food if possible. As soon as weather permits late brooding, allow the birds to get plenty of bright sunshine.

The egg-eating habit begins when eggs are accidentally broken and left about the nests or yards. In this way a taste for raw eggs is developed and many hens become regular egg eaters—eating their own or any other hens' eggs. The moral is, don't allow broken or cracked eggs to remain in the nests. Feed plenty of oyster shells and provide darkened nests.

BUMBLE-FOOT

Bumblefoot is a swelling on the ball of the foot and may resemble a corn or a dried abscess.

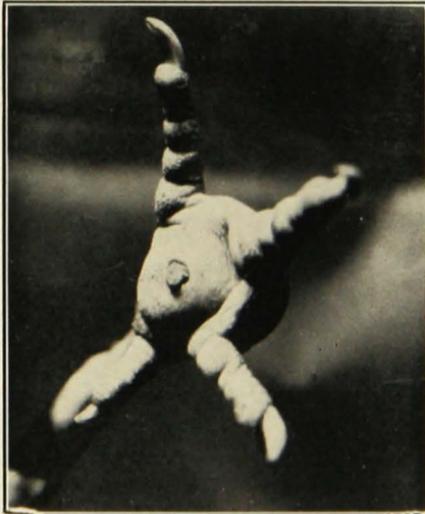


Fig. 9. Bumble Foot, Commonly so Called
The foot is swollen, with an abscess or core
in the center of the pad.

**Chickens Have
Many Bad
Habits, Too.**

Whatever the immediate cause may be, it begins from an injury to the bottom of the foot and an infection follows. High perches and rough cement floors are sometimes advanced as causes but this is doubtful. When the abscess or swelling has come to a head, it should be opened with a sharp-pointed knife and the pus drained out. Swab the cavity with tincture of iodine and return the bird to the flock. If the swelling is hard and not unlike a corn, it must be dug out much as one would operate on a corn.