CONTROLLING DISEASES AND PARASITES OF POULTRY
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CONTROLLING DISEASES AND PARASITES OF POULTRY

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The rate of mortality from diseases and parasites in poultry flocks is considerably higher than that found in other farm animals. For example, a loss of 20 percent of the flock during the first laying year is accepted as more or less normal.

In addition to mortality, diseases and parasites cause untold losses through lowered growth and production in diseased and parasitized flocks. With the narrow margin of profit existing in the poultry enterprise today, a reduction in such heavy losses becomes imperative.

In the case of diseases and parasites an ounce of prevention is worth tons of cure. Prevention is, therefore, stressed. Since often help is not asked for until after trouble strikes, practical means of treatment are offered for the more common troubles. The principles involved in prevention and their application are first presented and then the practical treatments and methods of control of the common transmissible diseases are discussed.

PREVENTION OF DISEASES AND PARASITES

Prevention of diseases and parasites of poultry depends primarily on maintaining the resistance of the birds and on keeping the concentration of disease and parasites at a minimum level. This is accomplished by the selection of breeding flocks which are resistant to disease, by the use of proper rations, and by strict attention to proper environment and hygienic conditions.

Select Breeders Resistant to Disease

It is important that the breeding stock be healthy, vigorous, and robust because, while a vigorous body may harbor disease, it has the advantage of having more natural resistance toward infection.

Work at various experiment stations has presented convincing evidence that there exists an inherited resistance to disease. This has been found to hold true for pullorum disease, fowl typhoid, and fowl paralysis. It may also be true for roundworm infestation. Inherited resistance to fowl paralysis offers one of the most promising means of bringing this expensive scourge under control.
Making full use of this knowledge is the task primarily of the highly specialized breeder of poultry who supplies breeding stock to other poultrymen. Application of this knowledge by these breeders will take years of intensive breeding. In the meantime, evidence from experiment stations indicates that the use of hens 2 years old and older in the breeding stock or in the flock supplying hatching eggs will result in appreciably lower mortality from fowl paralysis in the offspring than when pullet matings are used. Such a practice is of dual advantage since the older birds have not only demonstrated their ability to live but also, if proper culling has been practiced, they have shown their ability to lay profitably. Such characteristics are inherited.

Proper culling and selection of older hens, use of superior breeding males, and feeding of adequate rations are especially essential in flocks supplying hatching eggs.

Use Adequate Rations

Feed is important not only because it constitutes about half the cost of growing pullets and of producing eggs but also because it is one of the principal factors in maintaining resistance to diseases. Not only must there be plenty of feed and water in an adequate number of sanitary containers, but the formulation of the ration and the choice of ingredients and their mixing must be done with the utmost care. A properly formulated ration contains an infinite number of nutritive factors, each playing its part in the normal development and management of the body and formation of the egg and chick. Deficiency of a single factor may greatly impair growth, production, and health and thus enable the development of disease.

The vigor and vitality of the chick is not only inherited but is also affected by the feeding of the flock supplying hatching eggs. It is known that both vitamins A and G are required in large amounts in the breeders' ration in order to afford proper hatchability of good chicks. Green feed is the primary source of these vitamins, and milk products are excellent sources of vitamin G. A breeding mash differs from a laying mash in that it has a greater amount of milk and often of green feed to assure an abundance of these important vitamins in the hatching egg.

Experimental evidence shows that chicks hatched from eggs laid by flocks receiving inadequate vitamin A die in large numbers during the first week or 10 days, even when very large amounts of vitamin A are fed to the chicks. If any pullorum organisms are present, as they usually are, this disease may spread rapidly in such weak chicks and be wrongfully blamed for mortality really brought on by vitamin-A deficiency. Experience shows that there is far too much vitamin-A
deficiency in poultry flocks in Colorado, especially in the dry-land regions where green range is available only a few months during the year.

In both growing chicks and mature birds, vitamin A is necessary to maintain normal condition of the tissues lining the respiratory passages. In absence of the vitamin these tissues become thickened and the glands lose their normal powers of secretion of protective mucus. Infection may thus obtain a foothold in the form of nutritional roup or, more important, lowered resistance to colds and sinus infections. The losses from borderline vitamin-A deficiency must be truly enormous.

For a discussion of some of the other better-known nutritional deficiency symptoms, reference is made to bulletin 368-A. Adequate rations for chickens at all ages are given in bulletin 366-A. Feeding Chickens, and for turkeys in bulletin 370-A. Turkey Production in Colorado.

Environment Affects Health

A comfortable and clean environment for the birds is absolutely essential for normal growth, production, and health. This is true throughout the entire life cycle, beginning in the incubator.

Incubation practices

The vigor of chicks is seriously lowered by improper incubation conditions. For example, chicks hatched in machines with too low a humidity are small and weak. Such birds are more subject to disease and mortality from improper brooding practices and usually never develop into large, vigorous birds. Unhealed navels, usually caused by overheating, are extremely serious since infection is quite probable. Fortunately, low hatchability, unthrifty chicks, and dissatisfied customers soon put unskilled hatcherymen out of business. Hatcherymen of skill and reputation do not sell poorly hatched or cull chicks.

Hatcherymen now fumigate the hatching compartment during the hatch with formaldehyde gas to prevent spread of disease, especially pullorum, from any infected chicks. Further information on hatchery sanitation is found in a circular on that subject, available on request.

Hatcheries are becoming increasingly careful in the selection of flocks as sources of hatching eggs and are following more and more strict standards of feeding, breeding, housing, and management of such flocks.

Brooding practices

After the chicks are obtained, their rapid and vigorous development depends on proper brooding practices. The first few weeks of
life are critical, and the chicks may be permanently affected more readily at this time than at any other. Resistance to disease is maintained by proper brooding temperatures, by proper brooder-house ventilation, and by allowing sufficient space under the roost, in the house, and at the feeders and waterers. The importance of plenty of fresh, clean water and a constant supply of feed of the proper kind in sanitary feeders and waterers cannot be overestimated.

Probably more chicks are ruined by overheating in the brooder house than by any other single means. Plenty of fresh air and moderate temperatures are absolutely necessary for chicks and poults right from the start. This need grows greater as the chicks grow larger. For details of proper brooding conditions, see mimeographed circular 1688.

**Housing**

Poultry must have comfortable housing. It is estimated that over 90 percent of the poultry in the State is kept in houses which are inadequate. Most serious are inadequate and insanitary equipment and the failure to provide adequate ventilation and proper amount of space at water founts, feeders, nests, roosts, and on the floor.

One example suffices to emphasize the importance of this subject. An adequate and constant flow of air into and out of the house is necessary to remove moisture and used air from any house. Adequate intakes about 3 feet above the floor and adequate exhaust air outlets at the highest point in the ceiling must be always present regardless of the weather. Poorly ventilated houses are damp and uncomfortable and thus lower resistance to disease. Colds are especially prevalent under such conditions but the losses from poor growth and egg production are equally serious or more so.

Proper rules to follow in poultry-house ventilation, equipment, and management are given in bulletin 371-A on poultry housing principles.

**General management**

A farmer may assiduously follow the rules for proper feeding, housing, and sanitation, and yet be a failure in poultry raising because of poor management. The general management practices on a farm determine the success to a large extent. For example, on days when the temperature drops below zero are the birds coaxed off the roosts to get them eating, drinking, and rustling around? Before opening the door do you knock to warn them of your coming? Do you talk to them and move cautiously as you go through the house? If so, your birds are more comfortable and happy and are naturally more healthy.
Sanitation

Poultry must be kept away from sources of infection in the house, on the premises, and among the birds by proper sanitary practices.

1. **In the house.**—Prevention of disease can be aided in poultry houses by cleaning out the litter as often as it becomes dirty, damp, or badly broken up. Perches should be placed over screened boards, or better yet, droppings pits, in order to keep the birds out of the night droppings. Superphosphate should be frequently scattered over the excreta on the droppings boards or in the pits and over manure and used litter piles in order to aid in controlling flies and other insects. Litter and droppings should be used for manure only where no poultry will run for at least 2 years.

Sanitary feed hoppers and water founts with reel or wire guards to keep the birds out, and at the proper distance from the floor to keep litter and filth out, are very necessary. For growing chicks, the hoppers and founts should be blocked up every week as the birds grow. In all cases the water founts should be placed over screened frames to keep the birds away from the damp spots around the founts or pails. Dampness should be avoided because it encourages multiplication of disease organisms and even parasites.

Overcrowding, coupled with insufficient care in cleaning, is a frequent cause of overconcentration of disease organisms. Brooder
houses and equipment should be thoroughly cleaned and disinfected before and after use. Laying houses and equipment should be so treated just before the pullets are housed. Cleaning and disinfection of houses is largely a matter of "elbow grease," a broom, a scraper, and a scoop. First, all removable equipment should be moved out. All litter and droppings should be removed. Then the walls, ceilings, floors, and posts should be thoroughly brushed. A hand scraper should be used to get off caked material. A final sweeping is necessary. Then a lye solution (1 pound of lye to 6 gallons of water), preferably hot, should be applied by scrubbing with an old broom. Loosened material should be swept out. Lye water should not be used on galvanized or aluminum equipment. Finally, all such cleaned buildings and equipment should be disinfected with a cresol disinfectant recommended by the Bureau of Animal Industry (ask your County Agent for this list) made up as a 3-percent solution. Perches and nests should be thoroughly painted with creosote, a mixture of crankcase oil and kerosene, or a commercial preparation containing anthracene oil. After the house is thoroughly aired and dried, it is ready for new litter, the equipment, and the birds.

In buildings where respiratory diseases such as laryngotracheitis and infectious bronchitis have existed, formaldehyde fumigation is recommended as an additional disinfecting measure:

Dampen the room and equipment with water and, after closing the room air-tight, raise temperature as near 100° as possible. Wet newspaper may be tacked or packed over
openings and cracks. For every 1,000 cubic feet of air space, measure 1 pint of formaldehyde (40 percent) into a 2-gallon crock. Place crocks evenly around room. By each crock, place a paper square on which one-half pound of crude potassium permanganate crystals has been measured. Turn out any burners in the room. Then, starting at the corner farthest from exit, dump permanganate into the crocks, proceeding rapidly. Immediately close the exit tight and leave the room overnight or several days before opening and airing. For fumigation of incubators, write for special directions.

2. **In the ground.**—Probably one of the most predominant causes for the persistence of transmissible diseases on our farms is the practice of letting the birds run on the same ground year after year. This gradually builds up a great reservoir of infection and infestation. To remedy this, it is recommended that mature birds be confined entirely to the laying house the year around or at least to double yards which are alternated annually. The growing birds should always be brooded on new ground or that on which there has been no poultry or poultry manure for the preceding 2 years.

3. **Among the birds.**—Another great reservoir of transmissible disease lies in the older birds, thus providing a constant source of infection and infestation to the younger birds as well as to the premises. It is extremely important that no contact exist between old birds or their droppings and the young birds. Especially important is the general rule to kill all ailing birds, old or young, as soon as the ail-
ment is apparent, and to burn them immediately or to bury them under 2 feet of soil. To throw dead birds on the roof or to leave them on the ground is the height of folly.

4. On the farm.—The necessity for keeping out disease has been mentioned, and means of so doing are largely self-suggesting. Feed should be purchased in new sacks and never in used ones from some other farm. Good poultrymen keep their own supply of bags in which to purchase loose feed. They also keep their own catching crates in which to carry cull birds to market or to take them out to the front gate to transfer to the dealer’s truck. All poultry buildings and yards should be strictly quarantined against the entrance of neighbors, salesmen, and other visitors who might carry disease inadvertently. All birds brought back from shows are quarantined 2 weeks to assure that they are not coming down with any disease contracted at the show.

The introduction of mature breeding males from other flocks is being abandoned because they have been found frequently to carry disease and thus to spread it in the flock. More and more poultrymen and hatcherymen are wisely buying their breeding males as baby chicks and growing them right in the flocks where they are to remain and be used.
TREATMENTS FOR COMMON DISEASES AND PARASITES

As has been indicated, the first step to take after transmissible diseases are found in the flocks is to check over the program of control and prevention and immediately to remedy any shortcomings. Prompt isolation of all birds that are visibly ill is a sound practice.

An accurate diagnosis is the first essential. Someone who is familiar with diseases of poultry should be consulted, such as your veterinarian, if available, or your county agent. He may advise that one or two typically affected birds be sent by express prepaid to the Laboratory of Veterinary Pathology, Colorado State College, Fort Collins, for free diagnosis. Such shipments should be made not later than Wednesday of any week, should have the name and address of the sender on it and should be preceded by a letter describing the symptoms and giving details on feeding and general management.

A brief discussion of the more common diseases and parasites of poultry in Colorado and their treatment follows:

Diseases

1. Colds or coryza.—This is most frequently associated with overcrowding, poor or improper ventilation, inadequate rations (especially those low in vitamin A), or the presence of carriers in the flock. Any housing or feeding deficiencies should be corrected as already indicated. Colds are most common right after the pullets are housed in the fall. This may come from contact with old hens which are carriers. Wherever possible, pullets should be kept strictly segregated from old hens. The virus organism will not survive on the premises more than 4 days unless carrier birds are present.

Resistance to colds is hereditary but little use has yet been made of this fact. Special care should be taken to keep the water fountains full of clean water and to scrub them out daily. Disinfectants in the drinking water are of little if any value. For those who wish to use such a disinfectant, the following will be as effective as any:

Potassium permanganate crystals: Add sufficient crystals to color the water a light purple. Water must be renewed several times a day. The effectiveness is lost when the solution turns rusty brown.

Chlorine preparations, such as chlorinated lime, chlorine powders, and chlorine solutions: Follow the directions on the container.

When the birds are first coming down with colds, some slight value may be found from spraying them with a solution or powder several times daily:
Formaldehyde: Make a solution of one part of formaldehyde (40 percent) and three parts of water. Spray in a fine mist over birds on roosts or around hovers.

Chlorine dust: Use dust gun to spray over birds.

2. **Infectious bronchitis.**—This disease is becoming increasingly common and serious in chicks. It usually occurs when the chicks are 1 to 2 weeks old. It is evidenced by gasping for breath and by a clicking sound audible when the chick is held up to the ear. This is caused by exudate in the bronchial tubes. Infectious bronchitis is a virus disease, usually not causing extreme mortality, but it frequently sets the chicks back badly. It is very necessary to separate old from young birds.

Some relief may be found in raising the humidity under the hovers of coal and oil stoves by draping sacks over the edges of several water pails per stove and in increasing the ventilation in the house without lowering brooding temperature below the recommended level. The chicks may also be sprayed frequently from a spray gun with a solution or powder as indicated under colds or coryza.

When the disease is very serious, it may be necessary to dispose of the whole group by killing and burning the birds and then fumigating the rooms and equipment as already described. In any event no new chicks should be brought in while any of the infected ones are in the house. It is always preferable to market as broilers those that recover.

3. **Laryngotracheitis.**—This disease usually attacks chickens 6 weeks of age and older and is especially serious. It is an inflammation of the windpipe in which bloody mucus is first present; then a cheesy plug may be formed, strangling the bird. It is characterized by rattling, gasping, and "pump-handle" breathing.

When the disease is prevalent in the area, all birds should be vaccinated against
laryngotracheitis at about 12 weeks of age. All unvaccinated, mature stock should also be vaccinated. Whenever possible, the aid of the local veterinarian should be enlisted in obtaining fresh vaccine from a reputable biologic firm and in vaccinating the birds. Poultrymen can do the vaccinating if all the instructions sent with the vaccine are fully followed. This vaccination if properly done has little harmful effect on the bird or on production.

If the disease has just appeared in the flock, immediate action should be taken to vaccinate within 24 hours to help alleviate the attack. Birds with the disease are carriers after recovery. Birds that have been vaccinated are not carriers after 15 days following vaccination. Vaccination of young birds should be done every year until the disease is no longer prevalent in that part of the country.

Fowl pox. Note scabs on comb, wattles and face.
4. **Fowl pox.**—Fowl pox is characterized by blister-like lesions on the comb, wattles, and face of the chicken and on the head and caruncles of the turkey. These blisters later become scabs. The disease may be accompanied or preceded by symptoms resembling colds. These symptoms were formerly known as diphtheretic roup. If the disease is in the area, all birds should be vaccinated with fowl-pox vaccine. Vaccination is done preferably at about 3 months of age. It usually causes considerable reaction and seriously lowers egg production temporarily. For emergency use in laying flocks the pigeon-pox vaccine is often used since it gives little shock. However, it confers immunity for only 3 to 5 months and must be followed then with another vaccination, preferably with fowl-pox vaccine. Vaccinated birds are carriers.

As in laryngotracheitis vaccination, the help of the local veterinarian should be enlisted and directions with the vaccine should be fully followed.

If an outbreak occurs in the flock, uninfected birds should be vaccinated within 24 hours. Turkeys must not be vaccinated within 6 weeks of market time.

Vaccination should not be done unless the disease is in your area.

5. **Sinusitus in turkeys.**—This disorder, often called "swollen head," is very prevalent in turkeys. It is frequently associated with low vitamin-A intake, but not always. Care should be taken to ensure adequate vitamin A. The birds should never be roosted at night in low spots where cold or damp night air settles. Infected birds should be segregated and treated as follows:

Obtain a freshly prepared 4-percent silver nitrate solution or 15-percent argyrol solution from the druggist. Have two hypodermic syringes and a 16-gauge needle, 1 inch long. Insert the needle into the infected sinus and draw exudate into one syringe. Remove syringe from needle, leaving needle in place and fasten on other syringe with silver nitrate or argyrol solution in it. Inject 1 cc of silver nitrate or 2 cc of argyrol into sinus. Withdraw needle. Discharge material from first syringe into bucket containing 4-percent cresol solution.

If material in sinus is solid, slit sinus open with knife and remove material to disinfectant bucket. Swab out sinus with argyrol. A few birds may require a second or even a third treatment at intervals of 2 weeks.
6. Leukemia or fowl paralysis, iritis (pearl eye), tumors, enlarged livers.—This is the most common cause of mortality in maturing chickens and during the first laying year. As already shown, there is an inherited resistance to this disease and the most practical method of utilizing this information at present is to use as sources of hatching eggs only 2-year-old and older hens which have demonstrated ability to live and to lay profitably.

Recently it has been shown that chickens are most receptive or most likely to pick up this virus organism during the first 2 months of life and that droppings in the litter and yards from old birds are reservoirs of infection. It is, therefore, very necessary to avoid all contact between chicks and older chickens, even to the extent of raising the chicks on a separate farm where there are no older birds. In some cases mortality has been so severe that it has been necessary to dispose of all mature stock, to thoroughly clean up all houses and yards, and to allow the place to lie idle several months before new chicks were started. It has been quite universally and thoroughly
demonstrated that wheat-germ oil is of no value in the treatment or prevention of this disease.

7. Coccidiosis, trichomoniasis, hexamitus, and blackhead.—These are all caused by protozoan organisms in the lower digestive system, although trichomonads are frequently found in the crop. Infection comes from carrier birds through infected ground and infected irrigation water. Coccidiosis, at least, may be carried on the pads of flies, and poults like to pick flies "off the wing." Droppings under sun porches should, therefore, be well treated with acid phosphate (superphosphate) and frequently scraped out.

Birds with these diseases usually droop and show some evidence of "diarrhea" or discolored droppings. Very prompt action is necessary. The molasses or milk flush is advocated. Flushing helps to remove great numbers of the organisms in the intestinal tract, and cleaning every 2 days and moving to new range every 5 days breaks up the life cycle of the organisms causing most of such diseases and prevents reinfection.

The milk-flush treatment consists of mixing 40 pounds of dried buttermilk or dried skimmilk with 60 pounds of growing mash, or 25 pounds of dried whey with 75 pounds of growing mash, and feeding this mixture alone with plenty of water for 3 days. The molasses flush consists simply of using 1 pint of blackstrap (cane) molasses in every 2½ gallons of all drinking water for 3 days, feeding being maintained as usual.

During the flush the birds should be confined to wire floors or to houses which are well bedded with litter (new litter being added to the floor frequently to avoid contact with the droppings), or to a small range. Every precaution should be taken to guard against entry of droppings into feed or water. At the end of the flushing period the contaminated droppings or litter in any houses should be carefully removed and burned or buried under several feet of soil, the house and floors thoroughly scrubbed with lye solution (1 pound to 6 gallons of water), and finally sprayed carefully with 4-percent compound cresol solution. When confined to range during flushing, the birds should be kept out of the droppings and moved from that range immediately after flushing, not to return there for 3 years.

This treatment will be of no avail unless these precautions are followed.

8. Pullorum disease.—This disease of chickens, poults, and game birds is caused by the bacterium, Salmonella pullorum. It is
so important in chickens that a separate circular has been prepared on the subject and is available on request. (Extension Bulletin 372-A).

Pullorum disease in turkeys is growing in severity. It has been found that only the laboratory tube-test is effective in detecting reactors in turkeys and that in order to control this disease breeding flocks must be tested until no reactors are found. In addition, careful sanitation and management are essential. Purchasers of poult shows should be careful to determine that proper tube-testing was done on parent stock of poult shows they buy which are purported to be blood-tested.

Testing of game birds should be done by the laboratory-tube method until more is known about it.

Tube-testing can be obtained at cost at the Veterinary Division, Colorado State College, Fort Collins, Colorado.

9. Typhoid and paratyphoid.—These diseases are similar to pullorum. However, there is no reliable blood test for them, although at least some carriers appear to react to the pullorum test. The same strict precautions in keeping birds away from infected soil and in maintaining disease resistance through proper management and so forth are apparently quite effective. Flocks in which these diseases are known to exist must not be used as a source of hatching eggs. Vaccination with bacterins is not recommended.

10. Cholera.—This disease, so frequently and readily “diagnosed” by remedy peddlers, is not common and is rarely seen in poultry of any kind where all the proper methods of controlling or preventing disease are used to maintain peak health and low concentration of organisms. Vaccination with a bacterin is of no proved value.

Internal parasites

1. Roundworms.—These worms are found in the intestines unattached to the walls. They are smooth and round. The eggs are picked up from infected quarters and ground, and thus this reservoir of infestation should first be removed. Usually this is sufficient. However, if the infestation is heavy enough to lower body weight or production, treatment with special nicotine alkaloid tablets, or capsules or powder, according to the manufacturer’s directions is recommended. A veterinarian’s help in selecting a reliable manufacturer is suggested.

2. Tapeworms.—These intestinal parasites are flat and segmented. The heads are the generating portion and are buried in the intestinal walls. It is very difficult, if not impossible, effectively to “worm” birds for tapeworm infestation. The segments carry the
eggs which must be picked up by flies, slugs, worms, grasshoppers, or other insects in order to develop and become reinfective. Proper treatment consists of keeping such insects out of infested droppings in the houses and in the yards.

In case of infestation, the birds must be confined from ground on which poultry manure has dropped, and that ground must be plowed up and cropped. Furthermore, droppings on boards or in droppings pits must be sprinkled with superphosphate to help keep insects out. All infested litter should be oiled and burned. If the birds are put under such conditions, they usually will reduce the infestation under the danger point and eventually allow it to disappear. However, should the infestation be sufficiently severe to interfere with body weight and production, lye-treated grain may break off enough segments of the worms to give the birds an opportunity to recover if the preventive steps just mentioned are also taken. This treatment is as follows:

One tablespoonful of lye is added to 1 gallon of oats or other grains, and the mixture is covered with water and cooked for 2 hours. The birds are fasted for 18 to 24 hours and then are given as much of the treated grain as they will eat at one time, with plenty of drinking water available. They should be confined for 24 hours following the administration of any treatment, so that the droppings may be collected and burned. It is also well to remember that production is temporarily lowered by this treatment.

External parasites

1. Lice.—These parasites are pale, straw-colored insects which stay on the birds at all times. Their damage comes through the discomfort they create, since they do not suck blood. The following methods of control are commonly used:

   a. Sodium fluoride powder. — This is the best and cheapest treatment, but all birds must be handled. This powder can be obtained from drug stores and is applied by pinches placed deeply into the feathers under the vent, the wings, and the back of the head. Treatment is repeated as often as necessary.

   b. Blue ointment (mercurial).—This may be diluted with an equal part of vaseline and a piece of the mixture rubbed below the vent of each bird. Never use on setting birds, since this ointment on the shell kills the embryo.

   c. Nicotine sulphate solution (40 percent).—The fumes of this solution will kill lice if it is dribbled or painted on
roosts just before nightfall, and all birds are put on the roosts. This should be done on a quiet night and when the temperature is over 60° but not extremely hot. The house should not be shut up tight or the fumes will hurt the birds.

In all three methods it is usually necessary to give the treatment three times in succession about 10 days apart in order to kill new lice as they hatch out. Lice are present on practically all flocks and must be guarded against, especially in hot weather. They will lower resistance to disease tremendously.

2. **Mites.**—These parasites are small straw-colored insects which suck the blood of birds and thus appear red when gorged. They are on the perches and in the nests in the daytime and appear at night on the birds. They multiply tremendously rapidly in hot weather and may even bleed birds to death. The most effective control is to paint all perches and supports and all nests once a year with a commercial preparation containing anthracene oil. The equipment should be allowed to dry several days before use. Creosote sprayed onto the perches and nests and other hiding places is quite effective. A mixture of crankcase oil and kerosene is commonly used. The two latter treatments should be done several times, 10 days apart, to kill newly hatched mites.