GOOD POULTRY HUSBANDRY requires keeping the birds free of mites as far as possible, since these pests can do considerable damage. The remedies are simple and fairly easy to apply.

All classes of poultry are subject to the attack of mites, some of which are bloodsuckers, while others burrow in the skin or live on or in the feathers and still others occur in the air passage and in the lungs, liver, and other internal organs.

The total loss chargeable to poultry mites is large, since these parasites cause retarded growth, reduced egg production, poor condition, lowered vitality, damaged plumage, and even death. Much of the injury, consisting of constant irritation and loss of blood, is not apparent. A large percentage of the chickens, turkeys, and other poultry throughout the country are more or less constantly infested with one or several kinds of mites. Some of the more important forms will be briefly discussed in this article, and methods of combating them will be outlined.

THE CHICKEN MITE

Most poultry raisers are familiar with the common chicken mite (*Dermanyssus gallinae*). This pest is present in all parts of the country and affects all kinds of poultry. It is a bloodsucker and, when present in large numbers, saps the vitality of the birds, the loss of blood and the irritation caused being sufficient to make the fowls anaemic, weak, and restless. Egg production is seriously reduced, the eggs are spotted with mite excrement, and setting hens are disturbed and may be driven off the nests so that the eggs do not hatch. Hens have been known to die from mite attacks while sitting on the nest, and stock on feed fail to fatten. In addition, these mites may become annoying pests of human beings, especially persons who take

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care of poultry, and livestock in buildings adjacent to poultry houses are also attacked.

The chicken mites are night raiders; for the most part they remain hidden away in cracks and crevices during the day. Hens on nests may be attacked during the day, however, and on very heavily infested premises some mites are to be found among the feathers of the fowls during the day.

In all its active stages the mite sucks the blood of fowls, which is necessary to its development and reproduction. Usually the mites become engorged in a few minutes after inserting their beaks. They may bite the fowls on any part of the body. After feeding, the mites crawl off the host and seek a hiding place around the roosts or nests. When numerous, they may spread to the walls, floor, and ceiling of the poultry house. About a day after feeding, the adult female mites deposit 3 to 7 pearly white eggs in the crack where they are hiding. As many as 8 clutches of eggs are deposited by each female, with a blood meal preceding each.

The eggs hatch in about 2 days, and the young six-legged mite molts its skin without feeding and gains another pair of legs. The mite then feeds and molts its skin 1 or 2 days later. This process is repeated once more, and the mite is then mature. Since the cycle from egg to adult requires only about a week, multiplication can be very rapid under favorable conditions. During cold weather, development is slowed down and the life span is extended. An infested poultry house will remain infested 4 or 5 months after it is vacated, and even longer in winter.

The chicken mite will feed freely on pigeons, canaries, and wild birds such as sparrows. Wild birds are undoubtedly responsible for the spread of mites in some cases, but such things as infested baskets and crates, and even human carriers, are of much greater importance.

Since chicken mites hide during the daytime in cracks around the roosting and nesting places of the fowls, they may be eliminated by properly treating these places and without paying any attention to the fowls. The major difficulty is to reach the hidden mites. This requires thorough application of an effective and very penetrating insecticide.

The control methods recommended for the chicken mite are also effective against the fowl tick and the bedbug.

The first step is to remove unnecessary boards, boxes, and trash from the poultry house and yard. Next, remove and burn litter and nest material. Then apply one of the carbolineums (high-grade anthracene oil), crude petroleum, or creosote oil. If the house is very heavily infested, the entire interior, including the roof, should be sprayed. If the infestation is light, applying the material to the roosts, roost supports, nests, and adjacent areas on the walls usually suffices.

General spray applications are best made with a bucket pump, knapsack sprayer, or barrel pump. A high pressure must be maintained, and the spray material should be driven into all cracks. For light infestations a hand sprayer may be used, or the material may be applied with a brush.
The materials recommended have considerable penetrating power and persist well, so that if the application is thorough a single treatment will usually clear up the infestation. Occasionally a second application 3 or 4 weeks after the first is necessary, and this may be made with a brush.

Since these materials stain and are somewhat caustic, care should be taken not to get them on the clothing, face, or body, or on the fowls. The spraying should be done early in the day so the material will have time to soak in before the fowls go to roost. It is advisable to clean out infestations before hens are set and to treat brooders and colony houses before they are used for young stock.

There are a number of other materials, such as kerosene-pyrethrum and nicotine sulfate, which if thoroughly and persistently used will clean up an infestation, but in the long run the materials first mentioned are usually more effective and cheaper. Whitewash is of some value in reducing mite infestations by sealing the mites in the cracks, but it will not accomplish complete control.

THE FEATHER MITE

The feather mite (Liponyssus sylvirun) is an occasional but serious pest of chickens. Heavy infestations result in lowered condition of the birds and reduced egg production as well as a scabby condition of the skin and discoloration of the plumage. This mite remains on the fowls constantly and hence is more irritating to them than the common chicken mite.

Since the feather mite is found on a number of species of free-flying birds, including robins, swallows, and sparrows, it seems almost certain that many of the infestations on poultry farms come from the contacts of these birds with the chickens.

Figure 1.—Feather mites on a chicken feather.
The mite closely resembles the common chicken mite, but it is slightly smaller and somewhat more active. It can be differentiated from other mites by the fact that it is present in numbers on fowls in the daytime and causes a dirty appearance of the feathers (fig. 1). It prefers the areas below the vent and around the tail, but in heavy infestations it occurs on the back and other parts and may also be seen running about on the eggs in the nests.

The female lays its eggs among the feathers, where the young mites hatch and complete their development without leaving the fowl.

Since the feather mite remains on the fowls most of the time, it is necessary to treat the fowls with an insecticide rather than to treat the roosts, as in the case of the chicken mite.

In view of the seriousness of the pest and the fact that it is not generally distributed among poultry, it should be completely eradicated before it spreads any further. In numerous instances eradication has been accomplished by the following procedure:

Dip every well-feathered fowl in a tub nearly filled with water to which 2 ounces of fine sulfur (98 percent passing a 325-mesh sieve) and 1 ounce of soap have been added for each gallon. Hold the fowl by the wings over the back and dip it, taking care to wet all the feathers thoroughly, and duck the head also. Since this treatment makes all the feathers wet, it is necessary to do the work on a warm sunny day or in a heated building so that the birds will not be chilled while drying.

If the outbreak occurs during the winter, complete destruction of all the mites on the fowls may be accomplished by dusting them thoroughly and freely with fine sulfur.

While the fowls are being treated, the nest material and litter should be removed and burned and the nest boxes, walls, and floors sprayed as recommended for control of the chicken mite.

Nests of English sparrows around the buildings should be pulled down and burned, and these birds should be prevented from nesting about the premises.

Applying nicotine sulfate to the perches shortly before the fowls go to roost, as is sometimes done for controlling lice (p. 1054), has been found by Cleveland to eliminate an infestation of these mites when it is done under favorable conditions. This treatment is especially useful during cold weather when dipping cannot be carried out.

**THE SCALY-LEG MITE**

The scaly-leg mite (*Cnemidocoptes mutans*) commonly afflicts chickens throughout the country. In many instances it does not cause serious injury, but when nothing is done to check it an attack may result in deformity of the feet and legs and even actual loss of the tips of the toes.

The parasite is one of the itch mites, living beneath the scales of the shanks and feet and also attacking the comb, wattles, and neck.

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At first the only manifestation of the trouble is the irritation shown by the fowls, but later the scales begin to thicken and rise, and soon the feet and legs become unsightly.

The mites spread principally when the fowls are in close contact with each other, either in crates or on the roost. Occasionally a few fowls in a flock may be badly infested without the others showing material injury; nevertheless it is well to treat fowls as soon as there is evidence of an infestation.

Painting the roosts and nests with one of the carbolineums for the control of the common poultry mite will do much to reduce the spread of the scaly-leg mite. If only a few fowls show infestations they may be culled out and disposed of, or the legs may be dipped in crude petroleum (fig. 2). Care should be taken not to permit the oil to get on the feathers and not to immerse the legs above the hock. One application is usually sufficient, but if most of the scales have not dropped off after a month, a second treatment should be given. Sometimes it is necessary to dip the legs of all the fowls in a flock. This should certainly be done if there is evidence of widespread infestation among them.

**THE DEPLUMING MITE**

Another mite, *Cnemidocoptes gallinae*, related to the scaly-leg mite, frequently causes severe irritation by burrowing in the skin near the base of the feathers; as a result, the feathers are often pulled or broken by the fowls. The mite, called the depluming mite, is very small, scarcely visible to the unaided eye, and it is usually found in
the follicles at the base of the feathers, particularly on the back and sides.

At times the mites leave their burrows and crawl about, and this enables them to spread when chickens are in close contact.

The depluming mite can be completely eliminated from the flock by thoroughly dipping every chicken on the premises in a sulfur bath. To accomplish this a tub should be nearly filled with tepid water, 2 ounces of fine sulfur (98 percent passing a 325-mesh sieve) and ½ ounce of laundry soap being added for each gallon. The fowls should be submerged and the feathers raised so as to wet them thoroughly. The head of each bird should be ducked quickly two or three times.

If lice are also present on the birds, it is advisable to add ¾ ounce (1 heaping tablespoonful) of sodium fluoride to each gallon of water.

Figure 3.—Masses of chiggers on the skin of a chicken and the sores caused by them. Greatly enlarged.
Since the soapy water thoroughly wets the feathers, this treatment should be applied only on warm sunny days or in a heated building.

CHIGGERS (RED BUGS OR HARVEST MITES)

Chiggers (*Eutrombicula alfredugesi*) attack human beings and also infest chickens. Normally these small reddish mites feed upon wild animals, birds, snakes, and lizards. The adult chiggers are the brilliant red, velvety mites that are sometimes seen crawling on the ground. The mite is parasitic only in its first stage of development. It does not penetrate the skin, as is commonly believed, but attaches itself in much the same manner as does the tick. After a few days it becomes engorged and drops off, if it is not dislodged by scratching. During the period of attachment it injects a poisonous secretion that sets up a violent local irritation and itching. On fowls, chiggers are inclined to attach themselves in groups, mainly on the wings, breast, and neck. Injury to grown fowls is not very apparent except for the local lesions where the chiggers are or have been attached. Young chickens, however, are very susceptible to chigger infestations and soon become droopy, refuse to eat, and frequently die in a short time (fig. 3).

Chiggers are most abundant in the Southern States, especially on heavy soils. They usually appear some time after warm weather begins and are active until frost.

Since chigger injury to young turkeys and chickens is severe, where these parasites are abundant it is advisable to hatch the chicks early and, in case of late hatches, to keep the chicks out of the grass and weeds. Keeping vegetation closely cut in the poultry yards is helpful, and infestations may also be reduced by dusting the chicken ranges with sulfur at the rate of about 50 pounds per acre.

Dusting the chicks lightly with sulfur also aids in protecting them. The lesions on grown chickens should be touched lightly with carbolated vaseline or sulfur ointment.