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Insect pests and their control - Some poultry pests.

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INSECT Pests AND THEIR CONTROL

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SOME POULTRY PESTS

THE poultry industry is an important source of revenue to many people in this State. During the season 1955-56, the value of eggs received at all Egg Board grading floors was £1,348,995. It is thus evident that any pests which adversely affect the domestic fowl are worthy of careful consideration.

Fowl parasites may be divided into two main types—internal parasites and external parasites. It is only the latter which concerns the entomologist. There are a large number of insects, ticks and mites which may be associated with birds, some permanently and others intermittently. Most bird species have their own parasite fauna and many interesting problems of adaptation and relationship have been shown to be associated with this specialisation, but such matters are beyond the scope of the present article.

As is so often the case with pests of domestic animals, fowl parasites are now practically cosmopolitan in distribution. There are two main groups to be considered—the ticks and mites and the true insects including lice, fleas, etc.

Ticks and mites in their adult condition possess four pairs of legs, and so can be distinguished from insects which of course only have six legs, but for practical purposes the former are often grouped with insects under the heading "Insect Pests of Poultry."

THE FOWL TICK

Argus persicus (Oken).

The first record of this pest in Western Australia was made in 1897 at Northam, and since then it has spread throughout the warm and dry parts of the State. The effects of fowl tick on the birds are often severe to the point of death. The ticks cause the birds discomfort at night by loss of sleep, but a more serious result of their activity is the loss of blood by the bird, and the possible introduction of the parasite causing the disease known as "tick fever." Young chickens are usually most seriously affected.

Symptoms of "tick fever."—The bird shows a loss of appetite, a rise in temperature, restlessness, blackness and shrinkage of the comb, and diarrhoea followed by paralysis and often death. Those fowls that recover have a degree of immunity from further attacks of the parasite.

Hosts.—Hosts of fowl tick include the domestic fowl, ducks, geese, turkeys, pigeons, ostriches, canaries, wild birds and somethimes cattle.

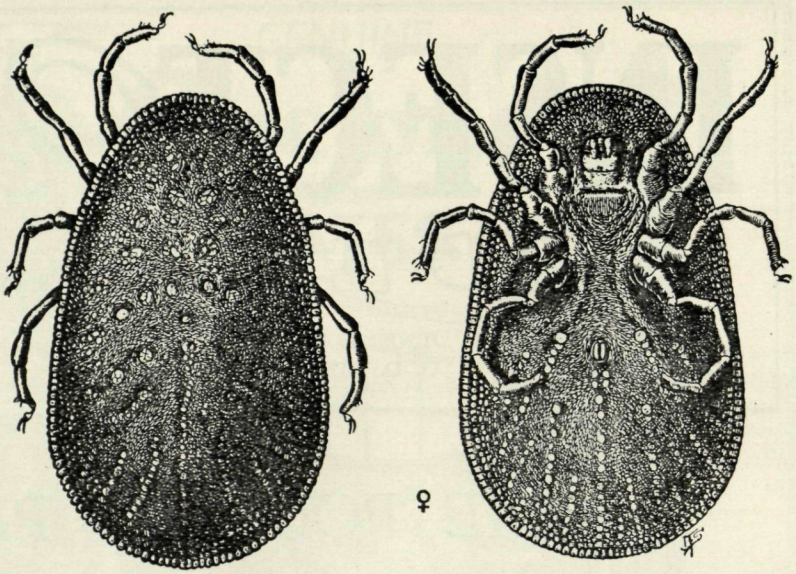

Fig. 1.—The Fowl Tick: Adult Female, upper and lower sides (enlarged)
(From U.S. Dept. Agric.)

Description.—The fowl tick is an oval, rather flattened creature, one-quarter to one-third of an inch long, without eyes, and with colour varying from light reddish brown to dark brown, depending on the amount of blood it has engorged. It has piercing and sucking mouth parts.

Habits and Life History.—In habits it is very similar and in appearance not unlike the common bed bug. It is essentially a night feeder, hiding in cracks and crevices during the daylight hours. Only the small six-legged "seed" ticks are found attached to the birds during the day as well as at night. As this period of their life is of short duration (5-10 days) it shows how easily an infestation can escape notice and puzzle anyone who finds birds unthrifty and yet carrying no parasites on them during the day.

The adult female tick lays eggs in batches of 50-100, and there are usually several layings totalling 500-900 eggs. These are brownish in colour, spherical and about 1/40th inch in diameter. They are usually laid in sheltered positions such as the cracks of perches and between pieces of wood used in the construction of the fowl house. These eggs hatch in from 2-4 weeks into six-legged "seed" tick which migrate during the night to the bird and attach themselves. The most favoured places of attachment are the breasts, thighs and under the wings. The "seed" ticks remain here for from 3½-10 days and engorge a large quantity of blood which is to last them over the next stage of their life. At the end of the feeding period, they are 1/10th inch long and drop from the birds to the ground. They then crawl into cracks, and after a week moult and emerge as eight-legged ticks in every way resembling the adult except in size. These small ticks only feed at night and return to the cracks in the daytime. They moult several times, each time increasing in size until they become adult. The period between the hatching of the egg and attainment of maturity is, under ideal conditions, about five weeks, but it may take considerably longer, as the tick can survive in any stage for long periods without feeding. "Seed" ticks may endure a fast for 5½ months, and adults have been known to survive four years of starvation. This fact is important in controlling this pest, as it is useless to try to starve it out and dangerous to take timber from old, long disused fowl houses for the construction of new ones.

The bark of trees also forms a good hiding place for ticks, especially in cases where unbarked bush timber is used for building purposes, or where birds roost in trees. Also, ticks will travel considerable distances along fences to other fowl houses. The eggs may be carried on old crates, etc.

Control.

Precautionary Measures.—The old proverb "prevention is better than cure" is especially appropriate when dealing with pests. If one erects a building which offers little protection to ticks, an accidental infestation may be easily eradicated. The houses should be built with new timber or with material obtained from clean premises, and if bush timber is used it should be secured from an area to which tick infested birds have not had access. Any cracks should be painted with tar, and suspended perches should be used wherever possible. Sheds constructed of angle iron and galvanised iron offer a minimum of harbourage to the pests but the initial outlay is high.

Finally, quarantine newly bought fowls in coops to make sure that they are tick free, particularly in the case of male birds.

Two weeks' quarantine is advocated.

Treatment of Premises.

If the structure in question is of little value it is wise to burn the complete henhouse and rebuild on a different site. If the structure is to be treated, nesting boxes, litter, straw, timber, etc., which the birds come in contact with must be burnt.

An application of 3 per cent. malathion spray to the structural portions of the poultry house will effectively control fowl tick infestations. Adult ticks and larvae are killed as they emerge to feed, and seed ticks are killed when they leave the birds. The sprays should be applied to the outside and inside of the henhouse, timbers, joists, etc., being thoroughly wetted.

Malathion as well as being effective on fowl tick will also control red mite. It also has an effect on the chicken body louse.

A thorough spraying with 2 per cent. aldrin emulsion to all parts of the henhouse will give a good control.

THE POULTRY MITE

Dermanyssus gallinae (Deg.).

Commonly called the red mite, this is a cosmopolitan pest of poultry and thrives under a wider range of conditions than the fowl tick, which has a distinct preference for warm surroundings. The mite attacks adult poultry as severely as young chickens. As with the tick, it normally feeds on the birds at night, leaving them during the day to return to the cracks and crevices of the perches, walls and surrounding woodwork of the pens or nest boxes. They have a habit of congregating

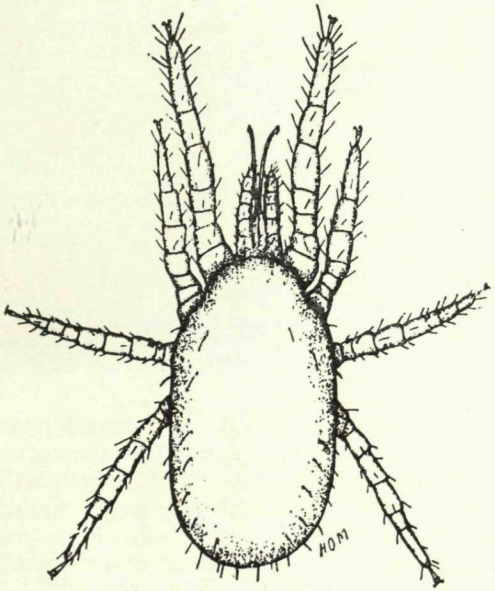

Fig. 2.—Poultry Mite (enlarged)
(After Mönnig)

in groups and it is not uncommon to find swarms of them under the roosts or to find them attacking a sitting hen in the daylight, but generally they leave the bird when they have engorged enough blood. The results of their attack may be fourfold:—

(1) They may cause great reduction in egg production.

(2) By constant feeding and irritation of the skin of the birds they may cause sitting hens to leave their nests, and even die.

(3) In severe cases they may cause great loss of flesh, unthriftiness, and reduction of vitality.

(4) They may transmit poultry diseases from infected birds to healthy ones.

Hosts.—The hosts of the poultry mite include pigeons, fowls, turkeys, pheasants and occasionally domesticated animals, and man himself.

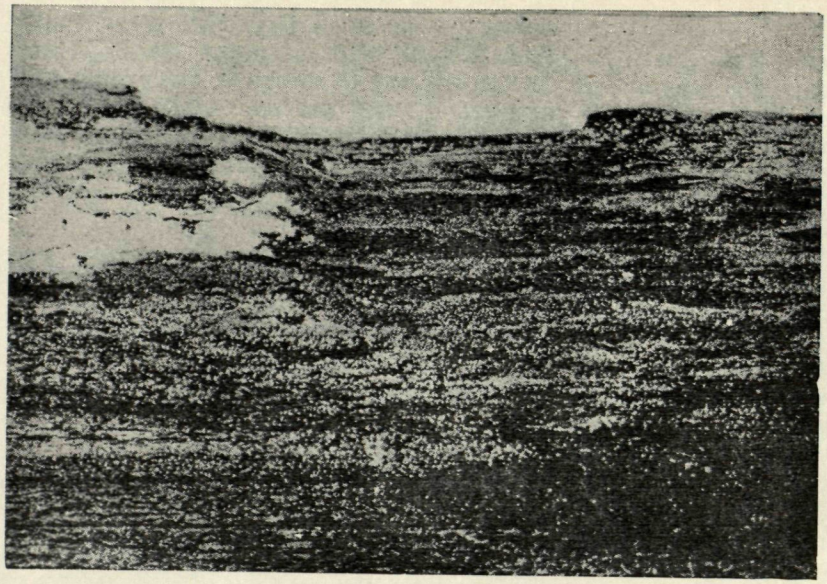

Fig. 3.—Old roost, showing excreta following mite infestation
(From U.S. Dept. Agric.)

Description.—The mite is a small pear-shaped, grey to red creature measuring 1/30th to 1/40th of an inch in length with eight legs and piercing-sucking mouth parts. They are not easily seen individually, but their habit of congregating together makes them noticeable.

Life History.—The adult female lays her tiny white, shiny, oval eggs in her daylight haunts, i.e., the cracks and crevices of perches, nest boxes, etc. The eggs hatch in from 2-6 days, depending on the temperature, and a small six-legged mite emerges. The latter begins to feed, and after several engorgements, sheds its skin and becomes an eight-legged mite resembling an adult except for size. After several more engorgements of blood and subsequent moults, it becomes mature. This development takes from 1-2 weeks, but depends largely on the temperature, the parasites being relatively inactive in cold weather.

In the absence of a host the adult mites can remain alive in infested houses for four to five months.

Control.—The control measures for this pest are directed chiefly at the hiding places and the same control measures as for the fowl tick may be adopted. One should be wary of old timber, etc., when constructing fowl houses, and also isolate any introduced bird for some days.

When infestation has been noticed all litter, spare boxes, etc., should be removed and burnt. Roosts and nest boxes should be removed to facilitate spraying, and replaced by something more suitable to future clean-ups if necessary. When the house has been swept out it should be sprayed thoroughly under good pressure with one of the following:—

The red mite can be successfully controlled with a 1 per cent. lindane spray. A liberal application should be applied to all wooden parts of the structure, after the birds have been removed and the house thoroughly cleaned out. The birds should be kept out until the fluid has thoroughly soaked into the wood.

A thorough spraying with a 3 per cent. malathion emulsion will give good control of the pest. A thorough application to all parts of the structure is essential.

Aramite can also be used to control mites. One pound of 15 per cent. wettable powder to 100 gallons of water makes the required spray. It can also be used in the form of a 3 per cent. dust. It is relatively safe to both operators and birds.

Although not as effective as the above treatments, the use of black leaf 40 is still effective in light infestations. Run undiluted black leaf 40, at the rate of ½ ounce per 100ft., along perches half an hour before the fowls go to roost.

SCALY-LEG MITE

Cnemidocoptes mutans (Robin & Lanq.).

This is another mite which is not an uncommon pest in poultry. The general symptoms are a thickening of the legs on the scaly potrions due to the burrowing of the mites into the skin. This causes the scales to protrude and exudation to take place, which cakes on the outside. The infection generally starts on the toes and spreads upwards. Scaly-leg is very readily transmitted from bird to bird.

Hosts.—Common hosts of the scaly-leg mite are domestic fowls, turkeys, pheasants, pigeons and cage birds.

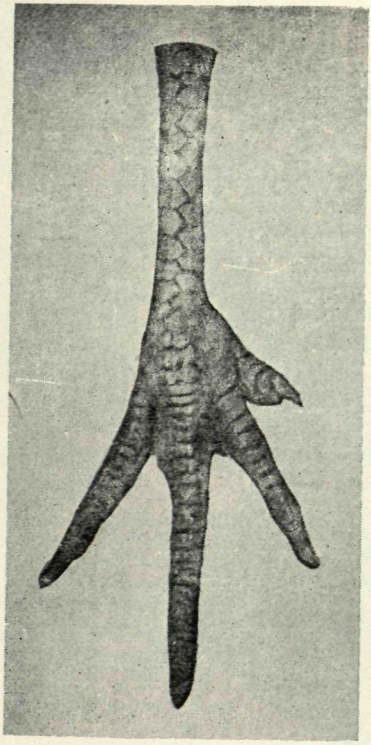

Fig. 4.—Healthy shank and foot of fowl
(From Jour. Agr. Victoria)

Description.—The adult mite which measures about 1/80th of an inch in length burrows into and lives in the skin. The female deposits her eggs in this position and on hatching, the young mites migrate to set up fresh colonies of infestation on the same bird, or on other birds which may be reached per medium of the perches.

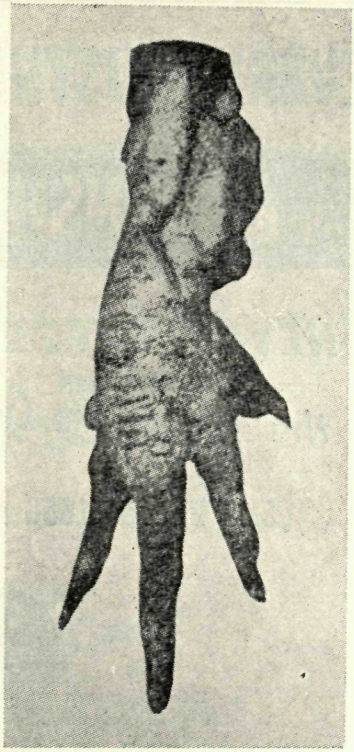

Fig. 5.—Shank and foot of fowl affected with scaly-leg mite
(From Jour. Agr. Victoria)

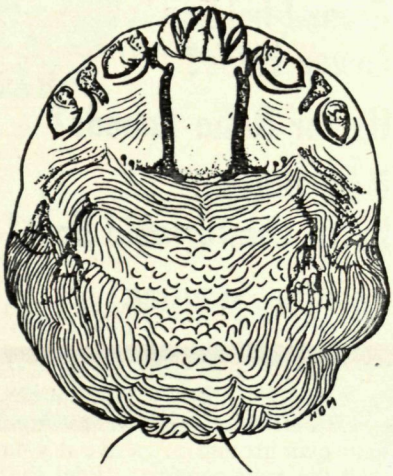

Fig. 6.—Scaly-leg mite
(After Mönnig)

Control.—Soak the legs in warm soapy water and scrub with a hard brush. After this apply an ointment of lard to which has been added some sulphur and kerosene (seven parts lard to three parts

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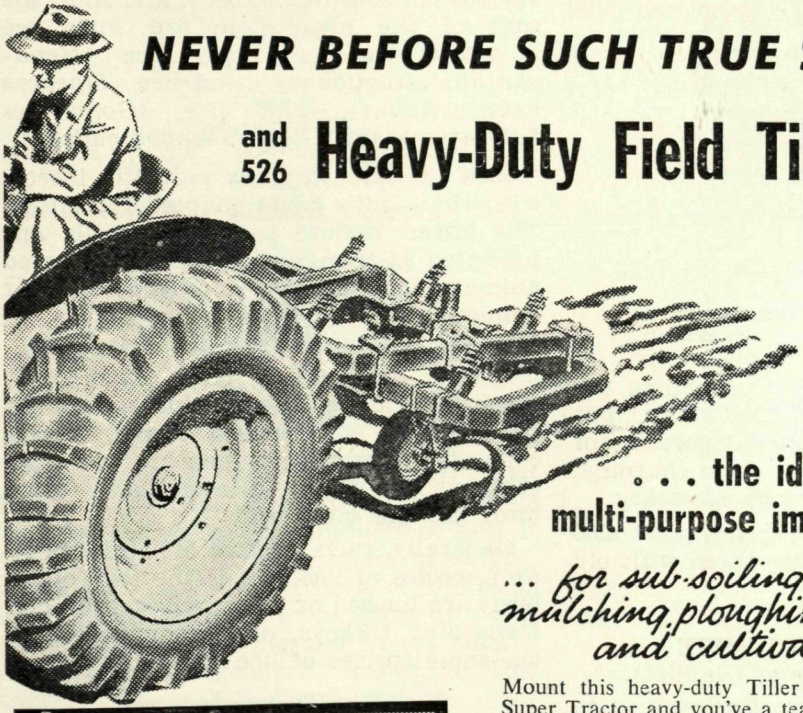

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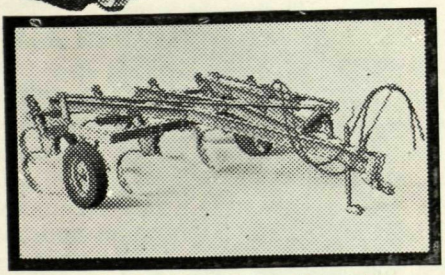

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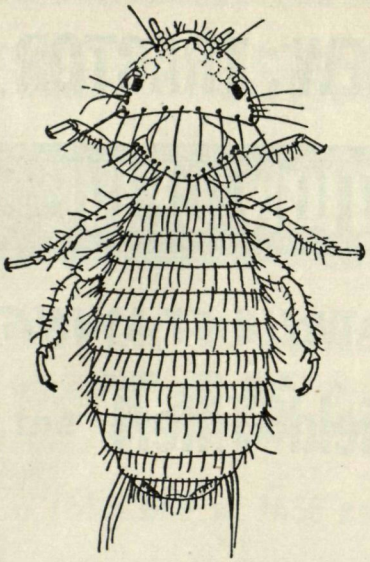

Fig. 7.—Female Body Louse (enlarged)
(After Herms)

sulphur, one part kerosene). Dipping the feet in kerosene will give good results, but getting any on the feathered portions of the leg may result in some burning, Repeated treatments may be necessary.

The treatment of the perches must also be carried out by painting them with old sump oil or kerosene.

THE DEPLUMING MITE

Cnemidocoptes gallinae (Railliet).

The depluming mite is closely allied to but slightly smaller than the scaly-leg mite. It has a comparable life history but attacks the fowl near the base of the feathers instead of on the legs and toes. Its attack start on the body and may progress to the neck, head and thighs. The mites themselves do not cause the bird to lose its plumage, but the intense itching they produce impels the bird to pluck its feathers in an attempt to reduce the irritation and a bald patch soon results. The affected quills will be found surrounded by scales and crusts and this condition frequently spreads rapidly.

Hosts.—The common host is the domestic fowl, but it also attacks other birds such as pigeons, pheasants, etc.

Control.—Local application of 20% benzyl benzoate emulsion or dipping the fowls in a fluid containing 0.1 per cent. lindane will give complete cure. To prevent spread through the flock it is necessary to treat all those that have had contact with an infection.

LICE AND FLEAS

Lice.—There are about 40 species of lice which are known to occur on poultry. Different types are to be found infesting various portions of the body, and so in the case of the fowl there are wing lice (*Lipeurus caponis*), body lice (*Menacanthus stramineus*), head lice (*Lipeurus heterographus*), fluff lice (*Goniocotes hologaster*), shaft lice (*Menopon gallinae*).

Bird lice are wingless parasitic insects with the mouth parts adapted for biting. The latter feature is not generally appreciated as so many lice found on furred animals are blood suckers that popular opinion regards all lice as such.

Unlike ticks and mites, lice remain permanently on the host bird. Opportunity exists for transfer to other birds, however, per medium of crowded roosts, during copulation, while a hen is covering chickens or where infested and clean birds use the same nest.

Generally, each species of bird has its own species of lice, but if the two lots of birds are housed or running together, e.g., fowls and turkeys, one frequently finds the same species of lice on them both.

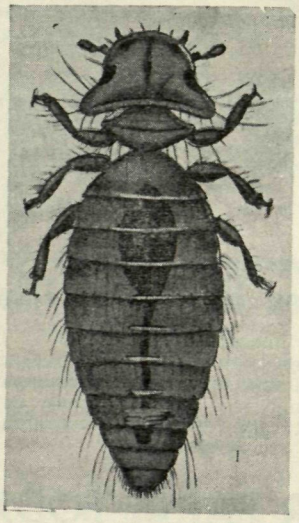

Fig. 8.—Shaft Louse
(enlarged)
(After Giebel)

The damage done is due to irritation caused by their constant moving about on the bird and their feeding activities. As stated above they do not suck blood but eat the scales of the skin and the base of the feathers.

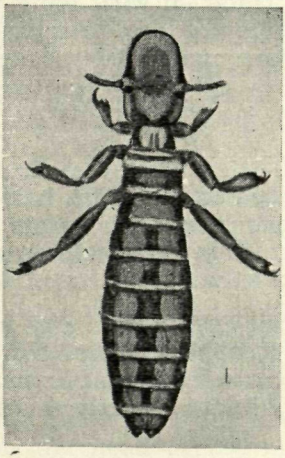

Fig. 9.—Wing Louse (enlarged)
(After Giebel)

The effect of this on the bird need hardly be stressed, as it must reflect itself in a reduction in egg production, and if the infestation is heavy, a loss of weight. It depends on the thriftiness of the birds as to what degree of infestation they can stand without showing the effects. Heavy infestations are generally associated with overcrowding and uncleanliness.

Life History.—In general, lice spend the whole of their lives on one host, except as mentioned above. The eggs are laid singly over a period of three weeks or so, and are attached to the base of the quills or on the feathers by a sticky secretion, and are popularly known as nits. The eggs are commonly seen in dense clusters, being greyish in colour. These eggs hatch in from five to eight days and the young insects closely resemble adults, but are of course smaller. After feeding they moult, i.e., shed their skins and increase in size. This process is repeated several times during a period of three to four weeks, at the end of which time they are fully grown.

The adult is a small elongated, flattened insect and in the case of the body louse about $\frac{1}{8}$ inch long. The general colour is greyish, sometimes with black marking. The six legs are provided with special claws to facilitate the insect running amongst and clinging to the feathers of the host. The mouth parts are on the under surface of the head.

Control.—Lice can be effectively controlled with DDT and BHC. In addition to the control of lice, bugs, and fleas, which is also a property of DDT, BHC has an effect on mite pests. The odour of BHC can be avoided by using lindane.

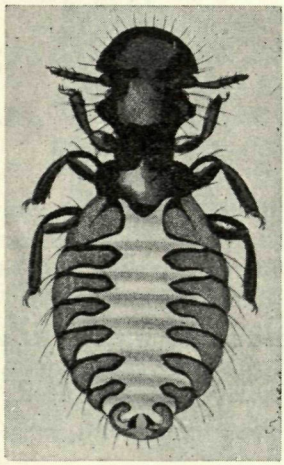

Fig. 10.—Fluff Louse (enlarged)
(After Denny)

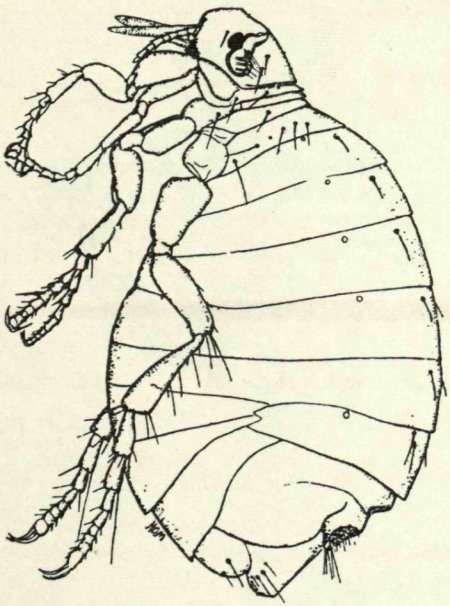

Fig. 11.—Stickfast Flea (enlarged)
(After Mönnig)

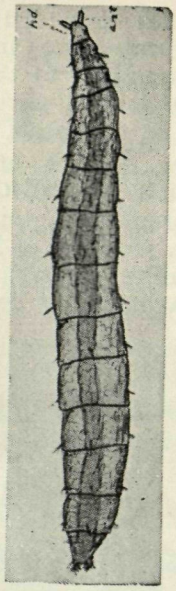

Fig. 12.—Larva of Stickfast Flea (enlarged)
(After Campbell)

A single dusting with BHC will eradicate lice if properly carried out. One per. cent. BHC dust should be used. Attention must be paid to the head, neck, vent, and bare area below the wings. There is sufficient insecticide retained in the feathers to kill newly hatched nymphs.

Dipping on 0.2 per cent. DDT, or 0.1 per cent. BHC suspensions should only be carried out in extreme conditions. The dip should be made up with tepid water and done early in the day to allow the birds to dry before nightfall.

Dusting with sodium fluoride is also effective.

The well-tried black leaf 40 techniques also give good control. One half ounce per 100ft. of perch, ½ hour before the fowls go to roost. The fumes which arise from this will kill the lice.

With head lice, particularly in the case of chickens, application of a non-irritating oil such as castor oil or neatsfoot oil should be applied directly to the affected areas.

When treating birds for lice, particular attention should always be paid to male birds, as they can be the means of distribution.

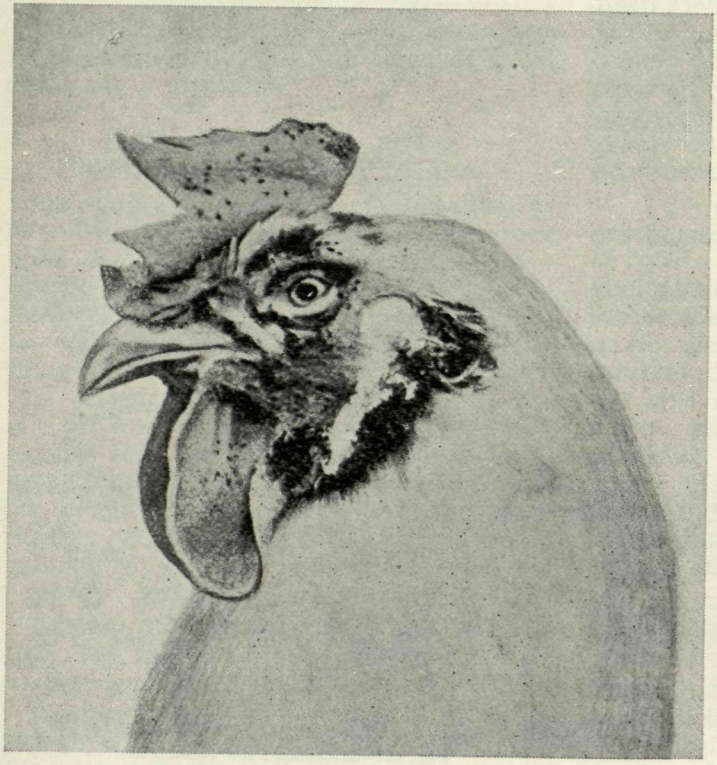

Fig. 13.—Head of fowl heavily infested with "Stickfast"
(After Newman and Allman)

FOWL STICKFAST FLEA

Echidnophaga gallinacea Westw.

This serious pest of poultry was first recorded in Western Australia at Geraldton on native animals in 1913, but it was not until 1920 that it was first noticed in the metropolitan area as a pest of poultry.

Hosts.—The hosts of the stickfast flea are extremely numerous. The pest has been found attacking all poultry and many other birds, also dogs, cats, horses, rabbits and numerous native animals, and even man himself.

Description.—The stickfast flea is light brown to brownish black in colour, the male being smaller and darker than the female. Both are smaller than the common dog and cat fleas, and are characterised by the fact that they attach themselves to their host, bury their mouth parts into an exposed spot and remain there for the rest of their lives. A favourite place is on the head of the bird, which may become literally black with fleas, but at moulting time they may also be found on the breast, under the wings and around the vent.

The effect of the flea on the bird is to weaken it from loss of blood. In heavy infestations the anaemic condition of the bird is indicated by the pale comb. Adult fleas have been known to live three months without a host.

Life History.—The complete life cycle takes about four weeks, varying according to the temperature. The female fleas lay at night while attached to the bird, and the eggs fall to the ground. The eggs are minute white objects from which in about four days a small worm-like creature emerges. This feeds on organic material, principally the dried blood excreted by the adult fleas, and shelters in the surface dust and litter on the soil. After several moults it grows to a length of about $\frac{1}{8}$ inch, ceases to feed and burrows down into the soil to a depth of about six inches. Here it spins a silken cocoon within which it develops into an adult flea. This last stage occupies about two weeks, then the adult flea emerges, burrows its way to the surface and searches for a host.

Control.—All new birds should be examined in order to prevent the introduction of the flea. Fleas may be controlled by smearing the infected parts with a non burning oil, castor or neatsfoot oil, or by the application of a sulphur ointment, care being taken not to contaminate the eyes.

Complete dipping in 0.5 per cent. DDT suspension or a 0.25 per cent. BHC suspension will kill fleas on the birds.

The floors of the henhouse should be made of concrete to facilitate cleaning, as it is in the dust and litter that the immature forms develop. The floors, roosts and nesting quarters should be sprayed with creosote oil. One half gallon will cover 1,000 square feet. A 5 per cent. DDT solution in kerosene, or a 5 per cent. emulsion in water can be used in place of creosote.

SAFETY PRECAUTIONS

The careless use of many modern insecticides can cause mortality amongst poultry flocks and have an adverse effect upon the health of operators.

Care should be taken to ensure that spray concentrates do not come into contact with the skin and sprayers should not inhale the spray mist. Any spray contamination should be washed off the skin with warm soap and water.

Drinking vessels, food containers and food scraps should not be contaminated with insecticides during the treatment of poultry yards.