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ENTOMOLOGICAL SERIES
CIRCULAR 10

HABITS AND CONTROL OF TERMITES

BY AUGUST E. MILLER



MATURE WINGED TERMITE
(35 times actual size)

URBANA, ILLINOIS
1926

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Natural History Survey



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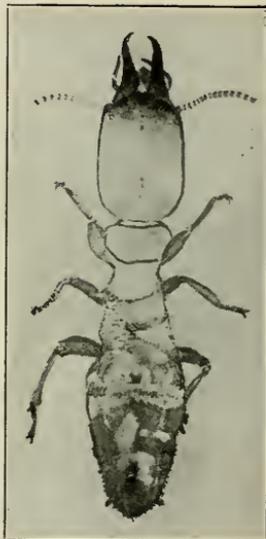
HABITS AND CONTROL OF TERMITES

BY AUGUST E. MILLER

In view of the increasing number of requests from residents in various parts of the State for information concerning the activities of Termites, it seems desirable to present this account of their habits and the measures of suppression thus far found to be most effective. An attempt has been made to formulate rather definite questions which might arise concerning a Termite outbreak, and to present answers which would be free of encumbering detail.



ADULT WORKER
(65 times natural size)



ADULT SOLDIER
(65 times natural size)

1. What are Termites? Generally speaking, Termites are insects of a rather primitive type, altho they maintain a rather highly perfected social organization, living in colonies made up of several classes—workers, soldiers, and sexual forms.

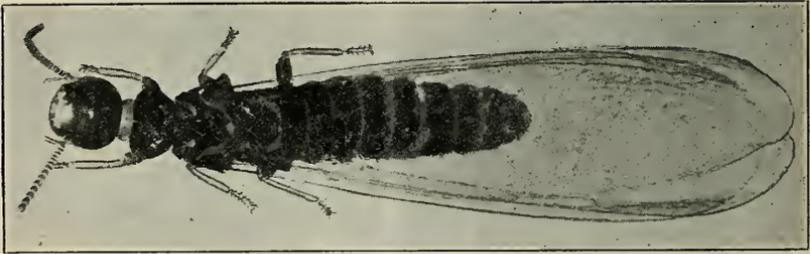
The workers are milky-white to gray, slightly flattened insects, about one-fifth inch long, without wings and with cutting mouth parts. They are usually the most numerous individuals in a colony.

The soldiers are of about the same shape and size, with no wings. They have a yellowish abdomen and large reddish-brown head with strong pincher-like jaws.

Males and virgin females are black, faintly tinged with brown, of the same general shape and size as the workers, and have four long silvery wings which give them a length of about one-half inch. Fertile females, or queens, are of the same color as virgins, but with bands of white across the abdomen in the older ones; the body is variously distended with eggs, and the wings have been broken off at a definite joint near the base. The latter individuals are but rarely seen.

Of the three species of Termites possibly occurring in Illinois, reference is here made only to the commonest one, *Reticulitermes flavipes* Kollar.

2. **What damage is done by Termites?** They eat all manner of wooden structures and materials which are favorably exposed, and frequently attack living plants. Conservatively estimated, the loss caused by Termites in Illinois amounts to \$1,000,000 annually.



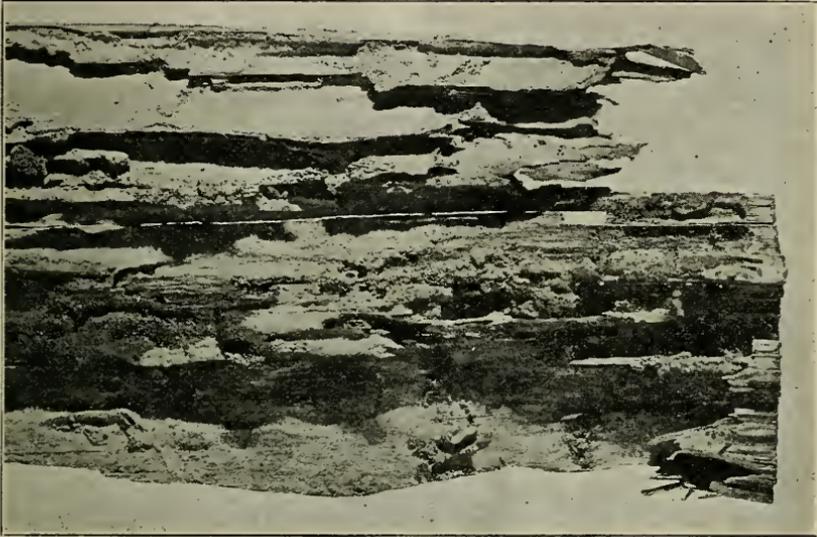
ADULT SEXUAL FORM WITH WINGS FOLDED
(60 times natural size)

3. **Do they occur everywhere?** Although not every property in every town in the State is infested, it seems safe to say that practically every community is infested to some degree. Since Termites work almost entirely under cover, their presence is seldom suspected until the damage has been done. The flight of winged individuals should be heeded as indicating the presence of these insects about the property.

4. **Are Termites Ants?** Although popularly called "White Ants," these insects are only remotely related to true ants, and for this reason the use of such a misleading common name is discouraged in favor of "Termites." They undergo a different type of transformation from stage to stage and, for the most part, have quite different food habits, which make them much more difficult to control than are the true ants. The colony organization, also, differs much from that of true ants.

5. **Where do Termites come from?** Our common species has long been known in North America. It at first maintained itself in and about dead trees and other vegetation in forests and fields, and still does so to a large extent. However, as man converted various forest products to his needs, these insects maintained themselves in the changing environment and became a ravenous property-destroying pest.

6. What are the stages in the life of this insect? From eggs laid along the walls of the galleries by the queen, there hatch minute white creatures resembling mature Termites in all superficial ways except the number of joints in the antennae. They are not at once able to take solid food, but are fed by the older insects. As growth proceeds, the skin is shed several times before the insect becomes mature. Preceding each moult, there is a brief period of retarded activity incident to the casting of the skin. Immediately following this act, the Termite continues its cutting and feeding.



A SECTION OF 2" x 12" JOIST SHOWING HOW COMPLETELY TERMITES CONSUME THE WOOD

Generally speaking, a Termite may be said to pass through an egg stage and a series of several immature, or nymphal, stages before it finally becomes an adult. The earliest immature stages are separated with some difficulty, although in the later stages the characters for separation are rather definite.

7. What are the food habits of Termites? Wood and other forms of vegetation comprise the bulk of the consumed food. Vegetable products, such as cotton and linen cloth, paper, paper board, straw board, and boxing, are typical of materials in which Termites will also work. All forms of wood, if slightly moist, will serve as food, altho a few tropical hardwoods and the resinous portions of some conifers are partially resistant. Very wet wood or very dry wood is seldom attacked.

8. How are the nests established? During May and June each year, there appears from each well-established nest a large swarm of winged males and females. Of the myriads of them flying into the air, only a few survive the ravages of birds, predaceous insects, and other unfavorable conditions. A pair will alight and search out some suitable site

in or near a log, stump, or other plant remnant. The wings soon break off, and mating occurs. The process of colonization is at first slow. A small cell is cut out which is in time extended into a short gallery. A few eggs are deposited. These hatch and the young soon begin cutting at the wood for food, thereby enlarging the gallery system. The queen's capacity to lay eggs increases, and there is a corresponding increase in the number of individuals in the nest. Thus, in a healthy colony, the system of galleries steadily becomes larger.

Certain secondary sexual forms to be found in most nests also wander to new sites through underground galleries, and thus establish new nests.

9. What are suitable nesting sites? Termites do not usually live in very moist situations, nor are very dry situations suitable for their colonies. They seem to prefer a moderately moist site where the wood, which serves as food as well as to partly house the colony, is directly in contact with the soil or, at most, only a few inches from it. Fairly wide departures from this rather ideal condition are sometimes found, yet moisture seems absolutely necessary, and a suitable food supply must be available.

10. How are Termites socially organized? Essentially, there are three castes of individuals present in a nest. The workers are primarily engaged in cutting new galleries into the wood, and in feeding the immature stages and queens. Most of the wood thus cut away is eaten at once. It is not digested by the Termites themselves but is acted upon by innumerable one-celled intestinal residents which convert the wood into a material from which the Termites derive their supply of energy. In addition to gallery cutting, the workers construct sheds of soil and wood particles to cover their runways where these are exposed. The several materials are firmly joined together with the aid of salivary and intestinal secretions.

The soldiers apparently are unable to cut and consume solid wood after becoming mature. Their food then consists largely of wood fragments partly digested by the workers, which they are able to secure in the galleries. With their large heads, they can effectually block the passageways against an enemy several times their size. They will also rush to the attack with wide-open jaws. If caught out of their galleries, however, they are at the mercy of even a weak adversary.

Several sexual phases may occur in a colony of Termites. Of primary importance are the normal and fully developed males and females capable of flight. It is the queens which are most active in perpetuating the colony. However, should the colony for any reason lose the services of a true queen, there will usually develop a replacement queen from among certain immature Termites. A few of these potential queens are to be found in the nest at all times and occasionally may become capable of reproduction, although a true queen is functioning. The males continue to live after the colony becomes established, and aid somewhat in gallery making.

11. How long do Termites live? There is little definite information upon which to base an answer to this question. It is probable that workers normally live from several months to as much as a year or possibly longer, and queens are known to live as long as two years.

12. What conditions about a property are most likely to encourage an infestation?

(a) Wooden cellar windows, whether painted or plain, so set that soil or debris is, or may come, in contact with them, offer the path through which Termites gain access to houses in 90 per cent of the cases examined in Illinois.

(b) Outside doors whose wooden sills rest on the ground or weak masonry, are liable to attack.

(c) Wooden porch and floor supports resting on the ground or on masonry insufficient to keep soil and debris from about the base, are unsafe.

(d) Buildings beneath which there is no cellar and in which wooden lower-floor supports either rest on the ground or are but slightly removed from it, offer points of entrance for Termites. Such situations are frequently quite damp and so further favor Termite colonization.

(e) Cellar walls are often of such imperfect masonry construction that Termites are able to enter the cracks, weak mortar joining, or porous gravel concrete. The unbroken airway left in most brick or block walls, if accessible to the Termites, is a favored place for extensive gallery making.

(f) Dead portions of injured trees and dead stumps; posts, poles, wooden plant supports, and trellises set in the ground; heavy fibrous roots and stalks of dead and living plants; and large accumulations of moist leaves, brush, animal dung, and vegetable debris—all offer suitable feeding sites for Termites.

13. What are the methods of checking ravages by Termites?

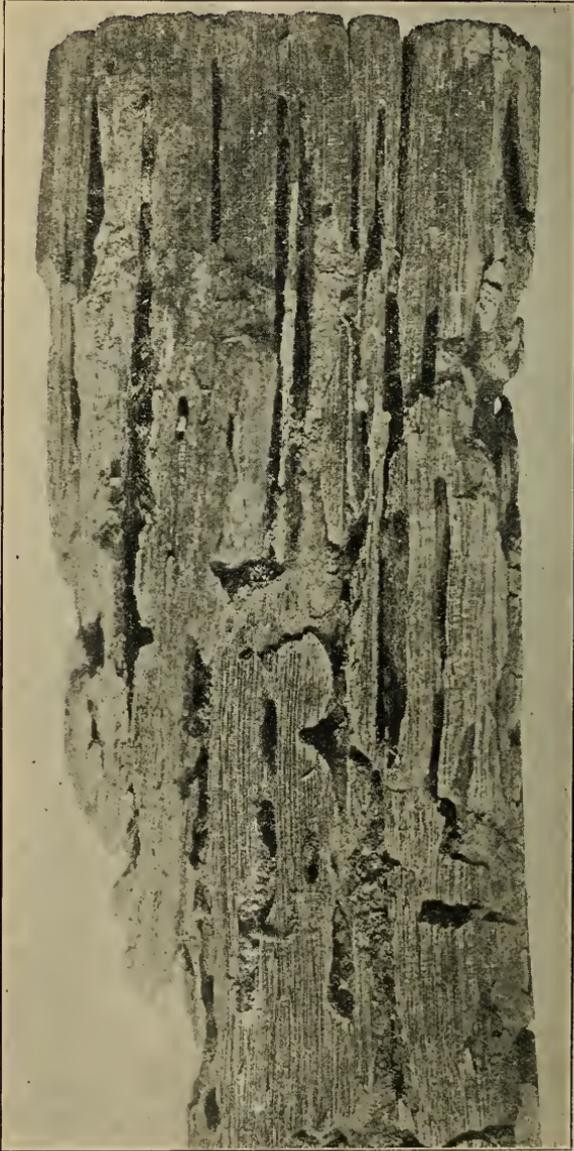
(a) Only metal cellar window frames should be used when there is the least possibility of their coming in contact with soil.

(b) Any wooden structure or support which must be used in contact with the ground should be thoroughly saturated with hot crude coal-tar creosote to a point at least a foot above the line of contact. Pressure-impregnated wood is more durable and well justifies its use. Wooden posts in the cellar should rest on the concrete and not extend through it.

(c) Mortar used in cellar walls should not contain more than 10 per cent of lime. At some point, preferably at the top of the foundation, a metal, slate, or tight cement cap should be set so as to break completely any path between the air space in the wall and the wooden sills.

(d) All wood which must be set in the ground out of doors should be thoroughly soaked in hot crude coal-tar creosote. The surface so treated should extend at least a foot above the ground line. All dead or dying trees or stumps and other useless wood or plant remains should be burned at once. These should not be taken into the house for use as fuel when Termites are known to be in them. All waste wood should be kept off the ground about the premises.

14. The keynote of success in combating Termites is absolute thoroughness in insulating wood and dead plant remains from the earth through the use of metal, masonry, or creosote. Community co-operation is the best assurance of success.



UPPER END OF A FENCE POST SHOWING
DAMAGE BY TERMITES

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