

WATER-AND-OIL TREATMENT AGAINST SOIL-INHABITING TERMITES AND ANTS*

PHILIPPINE termites of the genera *Coptotermes*, *Heterotermes*, *Termes*, and occasionally certain other forms, which build their nests under the ground, are injurious to posts and other wooden structures that are set in the soil or otherwise come in direct contact with it. There are also frequent cases of these ground-inhabiting termites laying their tunnels along cement walls of concrete buildings in order to reach the wooden floors and framework in the superstructure. The preventive measures recommended by various authors, namely, that of using metal strips or shields on concrete bases to isolate the upper wooden parts of buildings from the ground probably constitute the best and most dependable method of protection against subterranean termites; but unfortunately the practice is not feasible for general adoption in the Philippines. It would be applicable only in the case of the more expensive permanent structures. In houses in the average *Burrio* community, the primary consideration is cheapness, and the component parts are largely such short-lasting materials as bamboo, nipa, and rattan. Quite frequently, these buildings are very temporary affairs, and the owner cannot afford to set his posts on concrete foundations and put on extra appurtenances in the form of metal strips or shields. When the termites attack the posts or other parts of the building, as they invariably do, the damaged parts are replaced. More or less extensive repairs of this nature usually have to be made once a year or oftener.

Under such ideal conditions for termite attack wherein the stage is always set for infestation, damage may still be prevented or at least minimized by making regular and frequent inspection of the parts of the buildings in contact with the ground and promptly employing proper remedial measures. Ground-inhabiting termites betray their presence by the conspicuous tunnels of earth and other dark-coloured materials that they construct to cover their exposed runways on objects above the surface of the soil.

Paris green has in recent years come into vogue in connection with the control, both of subterranean and of wood-inhabiting termites in parts of the United States, Porto Rico and elsewhere. Paris green is placed along the runways of termites so that in their march some of the poisonous dust will adhere to the insects' legs and bodies. The idea is to take advantage of the termites' habit of licking one another's body, whereby they thus eat some of the adhering particles of the poison. The result is that even the young nymphs and the queen in the nest would ultimately be poisoned by the workers when they return home. The writer has made but limited trials of this method of control; the results have been either fair or indifferent. Possibly by following the recommendation of Smith of scattering the dust in the termite runways with a De Vilbiss atomizer No. 79 better results could have been obtained. It is intended to follow the work up in our laboratory.

During the past two years another method has been used by us in ridding the building which houses the Departments of Entomology and Plant Pathology, of underground termites which from time to time build

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their tunnels up along the concrete walls to the wooden parts above. One of these species, which invaded the building in June, 1929, was *Coptotermes wastator* Light, a very destructive and not easily controlled pest. Repeated trials to locate the nest of that particular colony had failed, we had dug up the ground for a depth of one and one-half meters along the base of the wall where the tunnels had their connection, but without success. We had tried the Paris green method, we had fumigated the soil with a copious supply of calcium cyanide granules, but all to no avail. The other infestations were by species of *Termes* two of which occurred on the wooden posts of the garage which were set in the ground and the rest in the building proper, as in *Coptotermes*.

The procedure we finally adopted was as follows: A shallow trench was dug in the soil where the termite tunnels were connected. This was then filled with water until the soil was so thoroughly drenched that absorption became very slow. If the place was near a faucet, a rubber hose was used; otherwise water was carried in pails. Enough waste engine oil (such as that drained from the crankcase of motor cars) or kerosene was then poured into the trench to make a very thick film on the surface of the water. As the water soaked downward, the oil was drawn by surface tension under the ground and through the communication galleries of the termites into the nest. Previous trials with oil alone, without water, had failed because the oil did not penetrate into the soil well enough to reach the main termite colonies, and, beside the fact that more oil had to be used, the treatment resulted in merely shifting the direction of march of the ravagers.

In our trials with this method, both in the use of *Termes* and the persistent *Coptotermes* one treatment was found sufficient to destroy an entire colony. The day following the operation, tunnels were sometimes seen rebuilt on the walls, either partly or wholly, in their original location; but these were the work of the workers that had been caught in the upper parts of the building during the treatment and shut off from their nests by the oil. In some cases these tunnels continued to be rebuilt for two or three days, but after this period the last remaining representatives of the colony disappeared. Nests of *Termes* that were dug out a few days after treatment were found to contain only dead individuals. There has not been a single case or recurrence of infestation from the same source following each treatment.

The simplicity of the method, the ease in obtaining the materials used and at little or no cost, and its efficacy against subterranean termites are among its desirable features. The practice has been found to work with equal success on ground-inhabiting species of ants which are a frequent nuisance around houses and yards. When treating ants' nests, however, it was found unnecessary (and also decidedly inconvenient) to dig a trench. The ground in which the openings of the nests were located was merely soaked thoroughly with water before oil was added. More water was then poured so as to give the oil better distribution. Several coconut-shellfuls of water and a few tablespoonfuls of oil are all that are needed for treating an average ant's nest. Because of the injurious nature of mineral oils, the method should not, of course, be used if the nests are located at the bases of tree trunks or other valuable plants.