

A Little Friend of the Rose

By S. Frank Aaron

"It can never be too strongly impressed upon a mind anxious for the acquisition of knowledge that the commonest things by which we are surrounded are deserving of minute and careful attention."—RENNIE.

THE flower-loving insects are all friends in need; but the unhoneeyed flowers also have their insect friends, not agents of fertilization only, but protectors and champions that fight the battles of those that must depend on the flower stems and leaves and buds to survive. But though the flowers are voiceless, they tell us with none the less eloquence what their enemies are and how they suffer by them. Ask the rose. The withered, skeletoned leaves proclaim the enmity of the saw-fly slug; eaten leaves and others folded over tell of the larvæ of the golden-winged tortricid moth; while cankerous, eaten buds and flowers denounce the rose bug, the aphides, that crowd the green stems and leaves of the newer growth and swarm all over the tender buds.

Annihilate the aphides upon a dozen stems of a thrifty bush and keep others off; then let a dozen others go full of the lice, and watch results. The number and the beauty of the blossoms will be the answer. Now, Nature generally makes a wise effort to strike a proper balance, and though we have heard this denied concerning the potato beetle, yet it is true, more or less. Thus she has furnished several antidotes for the aphid; if she did not the little pests would become a nuisance indeed, past all calculation. This salutary purpose is effected by the several larvæ of the syrphus fly, the lace-winged fly, the ladybug and a number of very small Hymenopterous parasites. Of these latter the most interesting and the most common is the pretty little fly known to the scientists as Praon, which may be called the cocoon-making parasite of the aphid. Any one with sharp eyes may discover this little friend of the rose at work, and may follow, with a little care, its complete life history.

At the time when the plant lice are thickest a small insect resembling a miniature wasp, or an ichneumon fly, which it really is, may be seen making its way among the fat aphides, moving leisurely and with a dignity quite beyond its size, for it usually is not longer than an eighth of an inch. It approaches one of



Little Friends of the Rose at Work among a Herd of Plant Lice

Any one carefully and frequently inspecting the rose bushes and the aphides gathered on the green and tender new growth may see enacted the small tragedies between the parasite fly and its victims.



Miniature Pig Sticking, as seen through Magnifying Glass

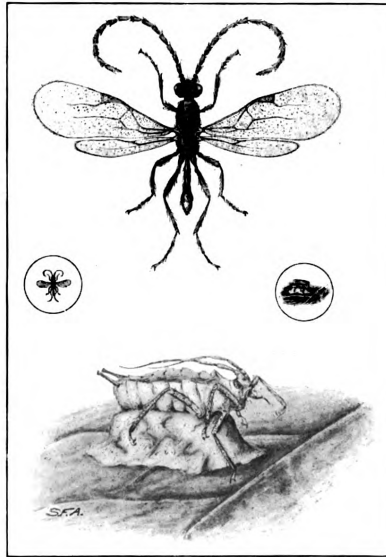
The fly of the rose aphid parasite stinging and laying its egg in the body of a rose aphid. The plump little plant lice look like hybrids between a verdant goat and a green pig and they get about much like overfat swine. Their inactivity permits them to be readily attacked, and their only attempt at defense is in wagging their bodies from side to side, which sometimes for a moment disconcerts the parasite fly.

the larger aphides and touches it with its antennæ as a means of certain identification, scent far outranking sight in such matters among insects. If this were an ant the aphid would respond with a liberal supply of the coveted honeydew, but knowing friends from foes it now slings its body from side to side, quite violently indeed for such a lethargic creature, and the little fly is pushed aside. Not liking this it moves on to another or smaller aphid with a less vigorous movement, or pausing a moment attacks the same aphid again, with perhaps better results. Choosing its position deliberately and carefully, with its slender, stiltlike legs lifting it high, it widely straddles its victim, its fore legs often resting on the aphid's back, its slender body and long antennæ much jostled by the agitated plant louse. But now the fly is not to be dislodged. Its keen, swordlike ovipositor protrudes from its sheath and in a moment is thrust deep into the back of the plant louse, and is held for just another moment, until an egg, so tiny as to pass through the slender organ, is deposited into the very interior anatomy of the rose pest. Then withdrawing, the fly straddles off and proceeds at once to convert another aphid into an incubator, and so on, until no doubt the egg supply, perhaps fifty or more, becomes exhausted.

Of course the aphid so treated does not die at once, else Nature's plan would miscarry. It lives and goes on feeding and maintaining the same stiff and seemingly contented attitude for a little while. Meantime the egg hatches a minute, white, maggot-like larva, and this at once begins feeding on the soft muscular tissues of its host. Some little time is required for the larva to complete its growth—five or six days during very warm weather, longer when it is cool. With an instinct that has ever been a marvel to the naturalist the little larva does not touch the digestive organs, the vascular system or the more important nerves for a period, thus permitting the aphid to live and feed until the appetite and growth of the parasite warrant it to eat all before it. Then the aphid dies, of course, and rapidly

becomes only an outer skin, with head and legs attached.

For some strange reason the aphid, not long before dying, forsakes its place among its fellows. As if ostracized for its condition, although its disease is hardly catching, it crawls away to one of the larger leaves, fastens upon it in exile and thus remains. It is obvious that this benefits the parasite; the aphid here is far less apt to be found and attacked by numerous other enemies that would endanger the life of its guest. But what can influence it? It departs from its habit, for it is altogether social and non-migratory. It removes to a less desirable pasture ground. Normally, if dislodged from the stem and falling on the leaves it crawls back as fast as its indolent legs permit to the stem again. The parasite is alone benefited, but it is out of the world, so to speak; it can not get at its host's locomotory appendages; it is a legless, eyeless creature that at best would make a poor guide if it should get out and take the lead. But the little thing, as unintelligent as it looks, maggot-like, has perhaps a mind of its own, as we have seen. The habit



The Parasite of the Rose Aphis, much magnified

¶ The upper figure is the fly as seen from above; the colors, black, rufous red and yellow, have almost a metallic luster, and the delicate, transparent wings reflect a beautiful iridescence. The lower figure is the cocoon of the parasite beneath the dead, dried and distorted shell of a plant louse, the insides of which have been eaten by the parasite larva while attaining its growth, after which it makes the cocoon. The little figures in the circles indicate the natural size.

is almost invariable; the victims crawl from their usual places and position themselves on the leaves. Out of seventy-one parasitized plant lice I found two on the stem and one on the tip end of a thorn, as if it thought a leaf ought to grow out there, but was too far gone to search elsewhere.

Upon attaining its growth the parasite larva cuts open the aphid skin underneath and squirms part way out, so as to have full swing with its head end. Then it begins the construction of its cocoon, made, as with most insects, of its saliva, and eventually becoming, after a few hours' work, a silken, parchment-like, bulging, tent-shaped affair, upon which the now shrunken and distorted skin of the aphid rests as on a pedestal. The parasite enters the completed cocoon and becomes an inactive pupa or chrysalis, and in a few days thereafter, if it is warm, the perfect insect, the tiny fly, emerges and takes wing to work more mischief among the rose pests. The illustrations fully elucidate the facts set forth in the text. They present a wonderful insight into a small natural force, not the less masterful because of its mimic scale.

Fire Protection

Safeguarding Temporary Structures



THE danger from fire to which any structure, large or small, is subjected, unless it be built in accordance with the most approved ideas concerning fireproof erections, is so imminent that only the most carefully constructed buildings can be looked upon as other than hazardous risks. Temporary structures do not escape this rule, and often require quite as much care in their construction and need as much protection against fire as permanent erections.

It is not many years ago that the whole civilized world was shocked at the dreadful catastrophe of the burning of the Paris Charity Bazaar. It occurred on May 4, 1897, and resulted in a terrible loss of life. It was occasioned by carelessness in the use of a lamp attached to the cinematograph. The flames spread with prodigious rapidity, and one of the most unnecessary of modern tragedies was enacted within a very short time. The building was a temporary one, but had previously been used for theatrical purposes. It was fairly well supplied with exits, one of which was locked or bolted at the time; but the flames spread with unparalleled rapidity, and the ruin was complete almost before the nature of the trouble had been realized. Many experts and many learned committees investigated this fire and drew up voluminous reports and papers concerning it, all of which pointed to one general conclusion: the need of greater care and the necessity for greater protection against fire dangers as urgent in structures of this class as in more permanent buildings.

More recently a somewhat similar case has attracted attention in England, fortunately without loss of life. A London man of wealth had built a temporary supper-room behind

his house for use in an extensive entertainment he was about to give. It was totally destroyed by fire immediately before the time set, occasioned by improper electric insulation. There was no loss of life, as has been said, because the room had not come into use; but subsequent investigation demonstrated conclusively that had the fire occurred when the room was in use there would have been a calamitous catastrophe. The owner of the premises brought suit against the caterer who had arranged the room, but the jury failed to give him damages.

This, however, is something quite apart from the important lessons to be drawn from the affair. The suit for damages attracted wide attention, since temporary ballrooms and temporary supper-rooms are quite common in London and elsewhere on the occasion of large entertainments. It was found that absolutely no provision had been made for fire or other danger. Not a single pail of water had been provided, nor a hand pump nor fire extinguisher of any sort. The temporary wiring was admittedly of the most dangerous sort, and yet no protection had been provided for use in any sort of emergency. The very situation of the room was also found to be dangerous: it was built over back additions to the house, and had only two exits; had any one attempted to break through the canvas walls he would have fallen into a deep area.

Buildings of this description are not erected every day, nor does every one have occasion to use them. Catastrophes in connection with them are, moreover, comparatively rare; but it is a singular thing that when fire does arise in them the resulting injuries are likely to be very heavy as well as thoroughly unnecessary.